The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XVI. No. 393 JANUARY 8, 1927 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0.

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices: Bouverie House, 154, Fleet Street, London, E.C.4.

Telegrams: "Allangas, Fleet, London." Telephone: City 0244

The Chemist's Work for the Empire

THE third annual report of the Government Laboratory at Bangkok, Siam, a copy of which has just reached us, illustrates the important work that small staffs of chemists are carrying on in distant parts of the Empire. After acting for some years as chemist and assayer at the Mint in Bangkok, Mr. A. Marcan, F.I.C., M.I.M.M., established the Government Laboratory there under the Ministry of Commerce and Communications and became its first director. He points out that while the facilities offered by the Laboratory are fairly generally realised, there are still many fields in which chemical services might profitably be utilised, and a gradual expansion of scope may be effected as responsible officials come to realise the importance of scientific assistance.

An important duty of the Bangkok Laboratory is the investigation of botanical materials with a view to their commercial utilisation. Some time ago an important scheme was sanctioned for the establishment of a technical laboratory, and the provision of plant on a semi-technical scale for the investigation of vegetable products such as drugs, oil seeds, tanning materials, essential oils, etc., likely to form the basis of new industries or exports, and also for the production on a larger scale of ethyl esters of hydrocarpus oil and vitamins extract for the treatment respectively of leprosy and beri-beri. Apart from its effect on the treatment of disease, all this kind of work tends to develop the natural resources of the district, to open up new businesses other than those dependent on rice, and to start industries of a simple chemical nature providing suitable occupations for an educated middle class. The plant referred to, unless we are mistaken, was the one that Dr. R. Lessing was commissioned by the Siamese Government to design and lay out, and it is satisfactory to hear that it has now been started and is working satisfactorily. In tropical and semi-tropical countries the great natural supplies of vegetation, nuts, seeds, etc., offer an immense field for the chemist, who may at any moment discover some way of turning them to industrial uses. Such institutions as the Bangkok Laboratory are doing valuable work in this direction for the Empire, and Mr. Marcan's plea for the more general recognition of chemical services is one to be warmly supported.

Protecting the Chemist's Rights

Two useful examples of the unobtrusive but practical way in which the Institute of Chemistry watches over the professional rights of the chemist are mentioned in the new issue of the journal. Information was recently received that a borough council had demanded the right to inspect a private house where a member of the Institute had a small chemical laboratory exclusively for his own use, without assistants, and in which no form of manufacture was conducted. An inquiry was therefore addressed to the Home Office as to whether a local authority had any such right and, particularly, whether a laboratory for the professional practice of chemistry was regarded as a factory. In reply, the Deputy Chief Inspector of Factories stated that such a chemical laboratory as that described would not come within the scope of the Factory and Workshop Act.

In the second case the Chemical Warfare Research Department advertised for an engineer with works experience for chemical plant design, erection, and maintenance. The candidate was required to have university or similar training and it was stated that preference would be given to ex-service men. The salary advertised for the position was £265, which the Institute considered absurdly inadequate for the services expected. On an inquiry being addressed to the Department a reply was received confirming the amount, though expressing doubt whether the type of man required would be obtained for the remuneration stated, in which case the question of an increased rate would have to be considered. A further letter was addressed to the Department expressing surprise at the offer of a salary which would not in ordinary cir-

cumstances attract a man competent for the design and erection of plant and for the responsibilities attached to such work. It would seem that the committee hoped to take advantage of the present industrial depression, as the result of which a good man temporarily out of work might be disposed to accept an appointment at a salary far below his real market value. It was pointed out, moreover, that such conditions as those proposed could only result in disappointment in the long run, because any such man would grasp the first opportunity of obtaining an appointment elsewhere, and that would obviously not be in the best interests of the Department. It was also mentioned that foremen of chemical works frequently earn more than £5 per week, and it might happen that the Department would be employing workmen whose wages would come to more than the pay of the man who was directing them, since chemical plumbers and lead burners, for example, earn 2s. 6d. an hour on a forty-eight hour week.

The Council of the Institute, in drawing attention to such cases, express the hope that although representations of this kind are not always immediately effective, in the course of time the authorities will realise the danger of a cheese-paring policy where scientific work of vital importance and of highly responsible character is involved.

Chemical Engineering Examinations

WHEN the papers set by the Institution of Chemical Engineers for candidates for the associate-membership were published recently they were recognised at once as a distinctly severe test of theoretical and practical qualifications. It is now announced that the first examination has resulted in one candidate only being recommended for admission. The examiners "were of the opinion that the standard of knowledge displayed by the candidates was considerably below that required by the Institution, although from the point of view of the chemical engineer such a standard must be attained in due time. Of the candidates presenting themselves, only one, Mr. Frederick O. Hawes, was sufficiently promising for consideration as a successful candidate." The result may seem at first a little disappointing, but there is only one way in which a young institution can secure a reputation for its diplomas and membership—that is, by insisting from the outset on a standard of qualification that is beyond all doubt.

The next conference, which the Institution is arranging for Wednesday, Thursday, and Friday, March 9, 10, and 11, promises features of considerable interest. On the Wednesday, there will be papers on "Lead-burning," by W. S. Freeman; on "Lead as a constructional material in chemical engineering," by S. J. Tungay; and on "Modern methods of sulphuric acid manufacture," by Dr. H. J. Bush, A. Grounds, W. G. Mills, W. A. S. Calder, and J. Fox. On Thursday, in addition to a works visit, papers will be presented on "Rubber in chemical engineering," by B. D. Porritt, and on "Effect of heat on strength of materials," by Professor F. C. Lea. Friday's programme will include the fifth annual corporate meeting, with the president's address; a paper on "The cracking of oils," by F. H. Rogers; and the annual dinner. In addition to the Institution, the Chemical Engineering Group continues its excellent educational work. On January 14, in the Lecture Hall of the Chemical Society, Mr. J. Ainger Hall will read a paper on "Thermo-electric and resistance pyrometry in industry," which will be supplementary to Professor Hinchley's recent address in Birmingham on "The measurement of temperature in technical practice."

University College Centenary Appeal

ON April 30 of this year University College, London, reaches the centenary of its foundation, and its authorities are appealing for funds for the further development of this great centre of teaching and research. The chemical department of the college has been the home of the activities of a long line of distinguished men. Prominent among them were Graham, the father of colloid chemistry; A. W. Williamson, who was among the early workers in the modern science of organic chemistry; and Ramsay, whose achievements (including the discovery of the rare gases of the atmosphere) brought him a Nobel prize. The good work still goes on, and, jointly with Professor Barger, Dr. C. R. Harington (who is attached to the medical school of the college) has signalised the centenary by the synthesis of thyroxin.

As far as chemistry is concerned, funds are required mainly for two purposes. £15,000 is needed to provide the electrical installation of the chemical laboratories. This installation was projected when the laboratories were rebuilt in 1912-14, but the outbreak of war led to failure to obtain the necessary funds. The other purpose for which money is required is for the department of chemical engineering. This department was founded in 1923, as part of the memorial to Sir William Ramsay. At this time of the day it is unnecessary to stress the great importance of a school of chemical engineering. The department is at present housed in temporary premises, and to build, endow, and equip a permanent laboratory £60,000 is necessary. This appeal for funds comes at a time when British chemical industry is being reorganised on a new basis to meet modern requirements and world competition, and the most sustained demand of the industry is for well-trained chemists. The moral is obvious, and it is certain that the appeal will not fall on deaf ears.

Scientific and Technical Books

THE past year witnessed an enormous industrial upheaval which, in many respects, greatly retarded normal developments. At least two activities, however, continued to progress smoothly: the first was scientific research, and the second the publication of scientific and technical books, on which the advance of science and all the benefits accruing therefrom to a great extent depend. As far as organic chemistry is concerned, note may be taken of *The Synthesis of Benzene Derivatives*, by S. C. Bate, and *Industrial Applications of Coal Tar Products*, by H. M. Bunbury and A. Davidson; while specialised departments in this field are represented by *The Chemistry of Essential*

Oils, by Horace Finnemore, *Synthetic Rubber*, by Dr. S. P. Schotz, *Intermediates for Dyestuffs*, by A. Davidson, and *The Chemistry of Drugs*, by Norman Evers. The expanding interest in chemical engineering is accompanied by the increasing number of publications in this field, among which may be mentioned Dr. G. Weyman's *Design and Arrangement of Chemical Plant in Relation to Its Economic Control*, *The Transport and Handling of Mineral Acids*, by F. Hirsch, and *Chemistry of Power Plant*, by W. M. Miles; while A. J. Hall's *Textile Bleaching, Dyeing, Printing, and Finishing Machinery* fills a very important want.

The "Chemiker-Zeitung" Jubilee

In its current number the *Chemiker-Zeitung*, founded in 1876, celebrates its jubilee, and sincere congratulations may be offered to a journal which has worthily represented German chemistry on both its scientific and industrial sides. The *Chemiker-Zeitung* has lived through a very remarkable period. At the time of its birth organic chemistry was a weakly infant, and physical chemistry had not even been born; yet it has lived to see one of the most romantic successes of synthetic organic chemistry—the production of artificial indigo—while in its later years the production of synthetic ammonia from atmospheric nitrogen has provided an example of the great advances achieved in physical chemistry and chemical engineering. The esteem in which the German journal is held is shown in the imposing list of congratulatory messages which it publishes—a list containing such names as Madame Curie, Dr. Duisberg, Dr. W. A. Noyes, and Professor Wollstätter. Included in the jubilee publication are a number of interesting articles on the present and future of chemistry, in which, among others, Ostwald writes on the future of German chemistry, Walden on electrochemistry, Dr. Bergius on coal, Dr. Bueb on nitrogen, Auer von Welsbach on element No. 61, and Professor Fritz Haber on "The Fiftieth Birthday of the *Chemiker-Zeitung*." Professor W. Roth, who has for many years acted as managing editor of the journal, contributes an interesting article on its history.

"C.A." Queries

So many inquiries reach us from time to time that we have decided to make a selection of them for publication, in the belief that many of the inquiries will be found of general interest and that readers may be disposed to supply information respecting them. The first instalment appears on page 45 of this issue. One of the features of these inquiries is the constant demand of home and overseas users for chemicals, chemical plant, etc., which they do not know where to obtain in this country. There appears to be some little lack in the organisation of many firms for making their products known to potential customers. How much business, we wonder, is missed because of the unwillingness to spend a little money judiciously and regularly in letting people know where the goods they require can be obtained. Yet this would seem to be one of the most obvious links in good business organisation.

The Calendar

Jan.		
10	Institution of the Rubber Industry (London Section): "Ageing of Raw and Vulcanised Rubber." G. Martin. 8 p.m.	Engineers' Club, Coventry Street, London.
10	Institute of Metals (Scottish Section): Discussion on "The Value of Research." Professor J. H. Andrew. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
10	Ceramic Society: "The Chemistry of Coal." Professor R. V. Wheeler. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
11	Institute of Metals (N.E. Coast Section): "Some Aspects of the Corrosion of Metals." U. R. Evans. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
11	Institute of Chemistry (Manchester Section): "Air Pollution." Professor J. B. Cohen.	Manchester.
11	Institution of Petroleum Technologists. 5.30 p.m.	House of the Royal Society of Arts, John Street, Adelphi, London.
11	Society of Chemical Industry (South Wales Section): "Magnesium and its Alloys." W. R. D. Jones. 7.30 p.m.	Technical College, Cathays Park, Cardiff.
11	Society of Chemical Industry (Birmingham Section): "A Study of the Rotatory Dispersion of Certain Derivatives of Hydroxy-acids." C. E. Wood.	University Buildings, Edmund Street, Birmingham.
11	Co-ordinating Committee of The Staffordshire Iron and Steel Institute, The Birmingham Metallurgical Society and Institute of Metals: "Forces set up in Strip-Rolling." H. S. Caswell. 7 p.m.	Girls' High School, Dudley.
12	Society of Chemical Industry (Nottingham Section): "Liquid Fuel from Coal." Dr. King. 7 p.m.	University College, Nottingham.
13	Optical Society: Ordinary meeting. 7.30 p.m.	Imperial College of Science and Technology, London.
13	Oil and Colour Chemists' Association: "Cadmium Colours and their Application to the Paint Industry." H. W. D. Ward. 8 p.m.	8, St. Martin's Place, Trafalgar Square, London.
13	Society of Chemical Industry (Manchester Section): Joint meeting with the Institution of the Rubber Industry: "Rubber Solvents." 7 p.m.	16, St. Mary's Parsonage, Manchester
13	Institute of Metals (London Section): "Hardening." Dr. W. Rosenhain. 7.30 p.m.	83, Pall Mall, London.
14	Institute of Metals (Sheffield Section): "Gas Furnaces and their Heating." P. Hopkinson. 7.30 p.m.	University, Sheffield.
14	Institute of Metals (Swansea Section): Discussion on "Pyrometers." 7.15 p.m.	University College, Swansea.
14	Oil and Colour Chemists' Association (Manchester Section)): "Lake Dyestuffs and their Application." A. W. C. Harrison.	Manchester.
14	Chemical Engineering Group: "Electrical Pyrometry in Factories." J. A. Hall of the N.P.L. 8 p.m.	Burlington House, Piccadilly, London.
15	North of England Institute of Mining and Mechanical Engineers: "Dry Cleaning of Coal." J. S. Carson. 3 p.m.	Neville Hall, Newcastle-upon-Tyne.
18	Hull Chemical and Engineering Society: "The Lodge-Cottrell Electrical Precipitation Process." H. W. C. Henderson. 7.45 p.m.	Grey Street, Park Street, Hull.
19	Electroplaters' and Depositors' Technical Society: "Electrodeposited Coatings for Prevention of Corrosion." H. Sutton. 8.15 p.m.	Northampton Polytechnic Institute, Clerkenwell, London.
19	Society of Glass Technology:	Manchester.
19	Royal Society of Arts: "Development of the Petroleum Industry in Persia." Sir John Cadman. 8 p.m.	John Street, Adelphi, London.

Commercial Value of High Purity Oxygen

A Great Advance in Simple Rectification

In view of the industrial importance of high purity oxygen, the particulars given below in reference to improvements in rectification apparatus introduced by the British Oxygen Co. are of particular interest. The improved method is applicable to plants of both the double and single column types, and with the latter some remarkable results are recorded below.

THE value of high purity in oxygen employed for metal cutting has been established beyond all question by numerous investigations carried out in recent years. It is broadly correct to state that every half per cent. increase in the purity of oxygen above the normal commercial quality of 98·5 per cent effects a saving of 10 per cent. in the quantity of oxygen consumed, and in the time required for cutting. The reason for this is obvious, if the composition of the cutting jet of oxygen is considered from the time it impinges on the plate until it finally issues at the bottom of the kerf. In all oxygen of 98·5 per cent. purity produced from the atmosphere by the liquefaction process, the residual impurity is mainly argon, an inert gas which cannot be removed from the gaseous phase by chemical combination. It follows, therefore, that its proportion must increase progressively as the cutting jet descends the kerf, the oxygen being rapidly removed with iron as molten oxide. It is because of the cumulative diluting effect of this inert gas that relatively small percentages of impurity in oxygen, which would be entirely negligible in oxy-acetylene welding, are quite appreciably detrimental in cutting.

The advent of mechanically controlled oxygen cutting machines, operating with precision and to exact dimensions, has emphasised the importance of purity in the cutting jet and has undoubtedly instigated recent research in that direction, both in this country and abroad.

A Novel Construction

The British Oxygen Co., Ltd., as the outcome of lengthy experiments and practical trials, have adopted a novel construction of capillary trays, or foam plates, in the rectification column of their oxygen separators, by means of which they claim, without any additional expenditure of power, to have improved both the quality and quantity of oxygen produced. This improved method is not only adaptable to new or existing large plants known as the double column type, but can be employed with equal success in small plants of the single column type.

One of this latter type, recently supplied by that company to an important client, under an exacting specification, was guaranteed by them to produce 500 cubic feet of oxygen of 99·5 per cent. purity per hour continuously for periods of not less than 50 hours.

On its official trial, this small plant ran without stop of any kind for a period exceeding 80 hours with a steady hourly output of 550 cubic feet of oxygen of 99·65 per cent. purity. This remarkable result was not obtained by any additional expenditure of power, but, on the contrary, both the power required and the percentage of oxygen lost in the nitrogen were less than in plants of the same capacity when fitted in the rectification column with the old type of bubbling tray, producing only oxygen of 98 per cent. purity. Engineers experienced in the working of liquid air plants for the production of oxygen will, no doubt, appreciate the efficiency of the rectification column of this small plant when it is stated that the amount of oxygen lost in the waste nitrogen was only 1·75 per cent. more than the theoretical amount for a single column.

Advance in Single Column Rectification

Apart from this remarkable efficiency, the results obtained by the British Oxygen Co. with this small plant are interesting because they indicate a great advance over single column, or simple rectification, plants in Germany. We are induced, at any rate, to draw that conclusion from a highly descriptive catalogue (translated) of a well-known German firm, which is now being extensively issued as propaganda in this country and the British Colonies. Referring to the simple rectification column, the German catalogue states that "98 per cent. is the highest purity that can be obtained with comparatively economical results," and that 10 per cent. of oxygen is even then lost with the nitrogen. Elsewhere it states that "single rectification plants will, under exceptional circumstances, produce 99·5 per cent. oxygen, but at this purity their working is hopelessly uneconomical."

The inaccuracy of these statements is conclusively demonstrated by the results obtained with the small plant manufactured by the British Oxygen Co., referred to above, where a purity of 99·65 per cent. is attained with an appreciably smaller loss of oxygen in the escaping nitrogen than in the case even of the "comparatively uneconomical" German plant producing oxygen of only 98 per cent. purity.

It would appear that, having rediscovered the double column system of rectification, which has been employed in connection with large oxygen plants for many years in this country, an effort is now being made to establish the superiority of that system for small plants, as well as large, by comparisons wholly unfair to the single column type.

Now that it has become possible, by the introduction of foam plates, to obtain economically oxygen of the highest purity with single column rectification, it is practically certain that for small oxygen producing plants that system will prove unassailable. It is only when relatively large industrial plants are required, and more especially when it is desired to collect nitrogen and argon as well as oxygen, that the more complicated system of double column rectification is to be recommended.

For the moment, however, we are concerned only with small plants, and, in view of the remarkable results now obtainable by means of foam plates with single column rectification, it would seem advisable that special merits claimed for the more complicated system of double rectification, applied to small plants, should be subjected to the closest scrutiny and the present position carefully investigated before any such claims are accepted as correct.

A Yorkshire Coke Oven Plant

CONSIDERABLE extensions are reported to be in progress at the works of the South Yorkshire Chemical Works, Ltd., at Parkgate. The original installation consisted of 85 waste heat coke ovens with by-products recovery plant, and there is now being added a battery of Semet-Solvay regenerative ovens of the most modern construction and equipment, introducing the latest features of American practice. The installation is designed for coking and the recovery of tar, ammonia, and crude benzol from coal. The battery of ovens (which are of 12 tons capacity) is served from a concrete bunker holding 2,000 tons of coal, and one of two electrically-operated charging larries. The coke is pushed out into a quenching car by one of two powerful machines, in which are combined the operations of coal levelling, coke pushing, and oven door handling. The hot coke will no longer be quenched on pushing, as has been the practice hitherto, but will be run hot to a quenching station by means of an electric locomotive, an arrangement which obviates the inconvenience to the operators and the very serious damage to the oven structure due to steam and water. The quenched coke is brought back in the car and slid on to a wharf, from which it is drawn by feed rollers, and it is then carried by a rubber band conveyor to a screening and sizing plant. This screening plant is designed for handling the large output with dispatch and efficiency. The breeze separated from the coke is used to raise all the steam required by the plant, including one of a pair of 750 kW. alternators, in Babcock and Wilcox boilers operated at 160 lb. pressure. The oven gases are handled by one of two Connersville exhausters, driven by Belliss and Morcom engines, and the alternators are driven by triple expansion condensing engines by the same maker. All these are housed along with a pair of motor generators and the switchboard in a suitable building spanned by a crane. There are other buildings to contain the ammonia saturators and stills, the crude benzol plant, and groups of the various tar, oil, ammonia-liquor and water pumps.

The Therapeutic Dyestuffs.—(II.)

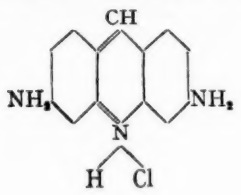
By T. H. Fairbrother, M.Sc., F.I.C., and Arnold Renshaw, M.D., B.S., D.P.H.

In THE CHEMICAL AGE *of December 25, 1926, there was published the first part of an article which is concluded by the following, in which the authors deal with the therapeutic activities of the acridine, azine, thiazine, cyanine, and phthalein dyestuffs.*

The Acridine Dyestuffs

THE acridine dyes, although considerably more expensive to produce than some of the simpler antiseptic dyes, contain among them some very powerful antiseptic agents. Acridine itself has no great antiseptic action on paramoecia (a small flagellate protozoon), although its toxic action has been found to be definite but small. Incidentally, it appears that the action of acridine is in some way connected with its fluorescent properties, since it is more pronounced in light than in dark.

The presence of free amino groups in the acridine residue greatly enhances the bactericidal activity, as is the general experience with therapeutic substances. Thus 3 : 6 diamino acridine hydrochloride (24) is far more active than acridine itself, and for purposes of sterilisation exerts a considerable action both on bacteria and protozoa. This series of compounds was examined in considerable detail by Lenz, who showed that 2 : 7 dimethyl 3 : 6 diamino acridine (Acridine Yellow) (25) also exerts a very strong antiseptic action. Its action is, however, irritant in nature, and for this reason the compound is not used in practice. The most satisfactory compounds of this series are those obtained by converting the basic substances into the acridinium compounds.



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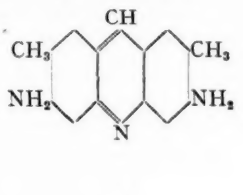

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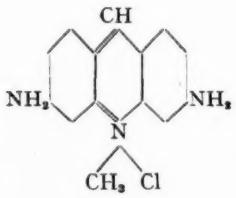

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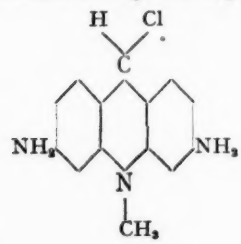
Thus 3 : 6 diamino acridine (proflavine) gives on methylation 3 : 6 diamino-10-methyl acridinium chloride (26) (Euflavin or Trypaflavin), which substance, together with its hydrochloride (Acriflavine), is used considerably for its antiseptic action, which is undiminished in serum solution. The difference between the action of antiseptics in aqueous and serum solution is in the majority of cases very considerable, and is a point that should be more generally considered when the question of antiseptic action arises. Pharmacologically, the acridine dyes are of interest in that they afford examples of substances containing what at first sight appears to be quinquevalent nitrogen, and yet fail to manifest the curare action which invariably accompanies this condition of nitrogen valency. This lends additional evidence to the conclusion deduced from chemical grounds that nitrogen has become tervalent through the migration of a halogen atom, and that the compound really exists in the form shown in (27). Research on the acridine group of dyes did not cease with the production of Euflavin or Trypaflavine.



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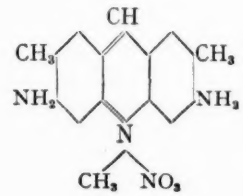

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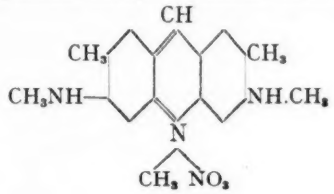
Acridine was converted to its methyl nitrate compound and the compound 2 : 7 dimethyl 3 : 6 diamino acridinium methyl nitrate (28) was found to possess trypanocidal properties. Furthermore, it has been found to be of value in the treatment of sepsis and in the form of its double compound with silver nitrate, has been sold under the name "Septacrol." Two further compounds are of interest, namely, 2 : 7 dimethyl-3 : 6 dimethylamino methyl acridinium nitrate (29), which



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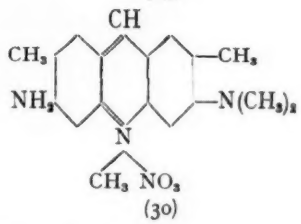
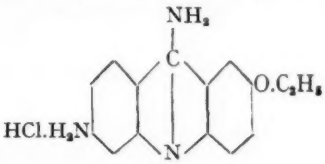


(30)

is more toxic than the other acridinium compounds, and the isomeric compound 2 : 7-dimethyl-6-amino-3-dimethylamino methyl acridinium nitrate (30). This latter compound sold as "Flavacid Nitrate," exerts a remarkably selective action against diphtheria bacilli, and is therefore of considerable use in combating this type of infection.

Whilst preserving the free amino groups of the flavine dyestuff antiseptics 2-ethoxy 6 : 9 diaminoacridinium hydrochloride (Rivanol) (31) exhibits a new type of molecule.



(31)

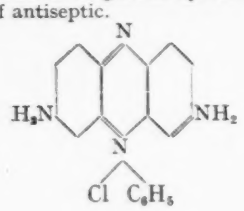
Extensive tests in Continental laboratories have shown that this substance is of considerable power as a general antiseptic. It is doubtful, however, whether its potency approaches that of auramine. The most recent development of the Flavine compounds is a series of metal-euflavine complexes, which are found to be even more intense in their action than the parent dyestuff. The chief among these compounds is Euflavine-Cadmium, Euflavine-Copper and Euflavine-Gold. The cadmium compound exhibits its most intense action on streptococci.

The Azine Dyes

As a class, the azine dyes offer many analogies of constitution to the acridine series. Thus Phenosafranine, which is probably the simplest member of the series, has the formula (32), and shows the general contour of euflavine. It is not, however, so good an antiseptic in the general sense, but evinces a powerful trypanocidal action.

A derivative of the pure substance has been marketed as a trypanocide under the name "Tryposafrol," but its exact constitution has not been revealed. Other higher bacterial organisms are also affected by Safranine (33) and cases of syphilis and Leishmaniasis have been cleared up by a com-

paratively small dose. The elaboration of the molecule by the introduction for example of a number of methyl groups as in Tannin Helio (34) tends to diminish the bactericidal activity—a state of affairs analogous to those obtaining in Crystal Violet—Auramine series. This is also seen to some extent in the case of Neutral Red (35) which, although a valuable diagnostic dyestuff, has but little claim to the status of antiseptic.



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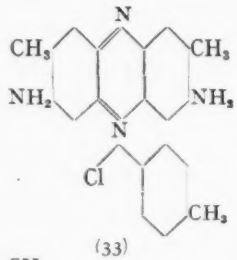

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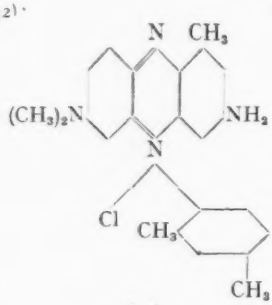

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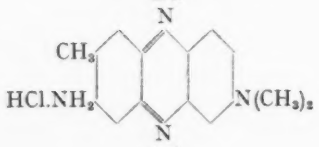

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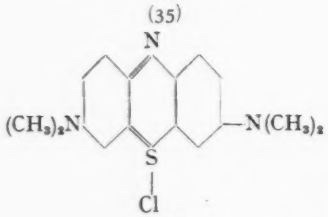

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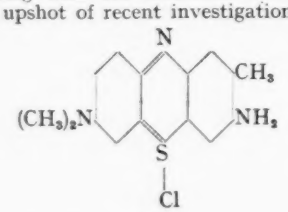
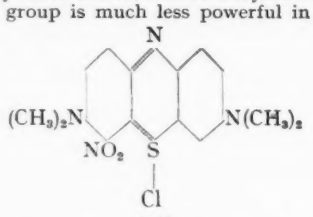
Thiazines

The thiazines, in addition, conform to the general outline structure of the acridine class, sulphur replacing the carbon link of this latter group. The simplest example is probably Methylene Blue (36), which was among the earliest dyestuffs to be used for medicinal purposes. It is not an extremely powerful antiseptic, but it has been widely used in general practice for the production of every conceivable kind of antiseptic action. Well over a thousand papers have been published dealing with the medicinal action of Methylene Blue, but the upshot of recent investigations tends to show



(37)

that its action as an antiseptic is comparatively mild and that for the majority of medicinal purposes it can be advantageously replaced by some of the newer dyestuff antiseptics. It is just possible that its action is merely that of an oxygen carrier being alternately reduced and oxidised. Toluidine Blue (37), which contains one methyl group less than Methylene Blue, is slightly more active, while Methylene Green (38) with the free nitro group is much less powerful in its action (*cf.*

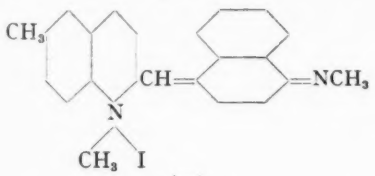


(38)

Turquoise Blue, *v. supra*). Taken on the whole, the replacement by sulphur tends to lower the antiseptic action slightly.

The Cyanine Dyes

The cyanine dyes constitute a family of compounds derived ultimately from quinoline, and since the chemistry of the quinoline derivatives is notorious for bad yields the present price of these compounds forbids their extensive use. At the present time Neocyanine commands the price of £4 12s. per gram, which compares very unfavourably with auramine, for example, at ¾d. per gram. Nevertheless the cyanine dyes contain among them a number of interesting compounds, many of which have been investigated by Browning and his co-workers (*cf.* Browning, Cohen, Ellingworth and Gulbrausen, B.M.J., August 25, 1923). Among the first of the cyanine dyes to be noticed for its bactericidal action was one of the isocyanines, 1 : 1 : 6′ trimethyl-isocyanine iodide (39).



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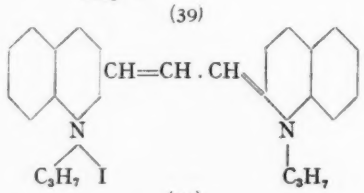

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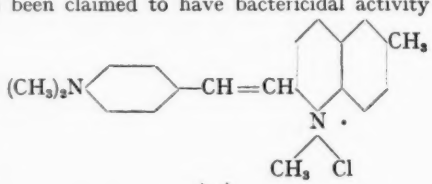
This dyestuff, as might well be expected, shows a marked selective action. *Staphylococcus Pyogenes Aureus* is particularly susceptible to its action, a solution containing 1 : 400,000 causing the death of the organism; on the other hand, solutions ten times as strong are necessary to kill *B. Coli*. In the carbocyanines where the aliphatic chain linking the two nuclei has been increased in length, this selectivity seems to be even more marked and 1 : 1′ dipropyl carbocyanine iodide (40), although active against staphylococci, seems inert in the presence of *B.Coli*.

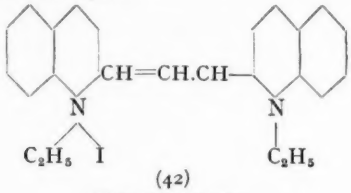
The action of styryl derivatives of quinoline is even more pronounced and it seems that these compounds must rank among the highest powered antiseptics. The compound 4-dimethylamino styryl 6 methyl quinolinium methochloride (41) has been claimed to have bactericidal activity against



(41)

staphylococci at the almost incredible dilution of 1 : 1,000,000, although with *B. Coli* ten times this concentration is necessary. Attempts to simplify this compound by the introduction of a pyridine in place of the quinoline nucleus led to a reduction in its activity. The most recent records of research in this series indicate that these compounds have, also, some trypano-

cidal activity. One representative of this series of dyestuffs has been introduced into general practice for the purposes of combating staphylococcal infection and has achieved some success. It is known as " Sensitol Red " and is 1 : 1′ diethyl carbocyanine iodide (42).



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The Phthaleins

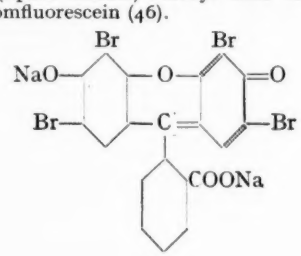
Among the phthaleins bactericidal action seems to be singularly weak, very few and those only of the derived Rhodamine type showing any appreciable action. There is, however, one important medicinal compound, phenolphthalein, in the group. Phenolphthalein is a mild purgative having a number of interesting advantages, not the least being the fact that its action is prolonged over several days. This is due to the adsorption of the phenolphthalein by the blood followed by re-secretion into the alimentary tract *via* the bile duct. Large quantities are made for therapeutic use, as it is the only synthetic purgative that has attained general use, and is put up in a large variety of forms ranging from tablets to liquid preparations in which the active ingredient is emulsified with petroleum and agar jelly. The original method of preparation devised by Baeyer is still in use, viz., the condensation of phenol and phthalic anhydride in the presence of sulphuric acid.

Among the other phthaleins which are of interest are the " Eosins." Of these three are clearly recognised :—

(1) Eosin. (Yellowish) Sodium salt of tetrabromfluorescein (44).

(2) Eosin. (Bluish) Sodium salt of dibrom dinitrofluorescein (45).

(3) Eosin. (Spirit soluble) Methyl ester of the potassium salt of tetrabromfluorescein (46).



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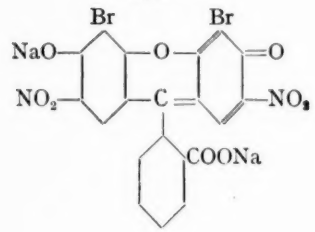

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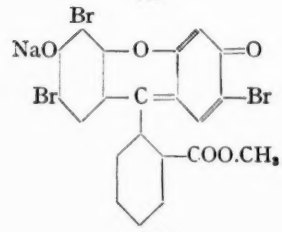

(46)

Of these the first and last are comparatively harmless, but the second (Eosin Bluish), presumably on account of its free nitro groups, has a distinct poisonous action. Great interest attaches to these compounds on account of their action on paramoecia and other of the lower organisms. In the dark but little action takes place, but in the presence of light the organisms are killed by solutions as attenuated as 1 in 1,000,000. The action is, apparently, connected in some way with the fluorescent nature of the dyestuff.

Small quantities of various dyestuffs, it may be mentioned, are used for purposes of diagnosis in medicine—principally on account of the extreme readiness with which they can be detected in extreme dilutions. Thus for determining the efficiency of the gastric function methylene blue is employed, while indigo carmine and tetraiodo-phenol-phthalein find a use in the diagnosis of other pathological conditions.

As was mentioned previously, the actual mechanism in antiseptic action is obscure and as yet we are unable to say whether their action is direct or indirect. The direct action theory is, of course, the " receptor " theory of Ehrlich—a hypothesis which, it seems, is becoming less capable of explaining satisfactorily the facts, as more of the latter come to light, and which will in all probability soon be supplemented by an indirect theory of action in which the intermediate formation of bodies of the enzyme or catalyst type is involved.

New Year Calendars, etc.

THE British Dyestuffs Corporation issue a very neat pocket diary and season ticket holder in leather. In addition to calendar and engagements diary, several pages are occupied with useful technical information ; there is also a convenient memorandum or note book.

Scottish Dyes, Ltd., are issuing a leather-covered diary and notebook, the latter being of the detachable refill variety. The diary contains 33 pages of general and technical information, the latter dealing largely with dyestuffs (Caledon, Celatene, Solway, etc.), as regards fastness and identification, etc. ; with dyeing instructions, calico printing recipes, notes on wool printing, etc.

The handy pocket " Engineers' Diary " (No. 399) received from Messrs. Collins provides an interesting and valuable guide on all points of vital interest to engineers. It is well bound in red pig-skin, and in addition to the usual postal information, weights and measures, etc., it contains over 120 pages of useful formulæ and tables covering the leading branches of engineering, including heating and chemical engineering, hydraulic and gas engineering, etc. The information is well arranged for quick ready-reference purposes, a full index of contents enabling the fact required to be found at a glance.

Among wall calendars for 1927 the " Cyanamide Calendar," published by Fertiliser Sales, Ltd., is a particularly attractive publication. It contains a series of very fine photographic views illustrating agricultural work in different parts of the world, notes on farm work for each month, and suggestions as to the best methods of applying fertilisers. Other useful commercial wall calendars have been received from Manlove, Alliott and Co., Ltd., Nottingham, illustrating particularly their laundry machinery, and R. H. Kirkup and Co., mining, mechanical, and constructional engineers, of Gateshead-on-Tyne.

New Use for Asbestos Waste

A NEW use appears to have been found for the millions of tons of waste material produced at the Canadian asbestos mines. An engineer, Mr. P. C. Armstrong, on a casual visit to Thetford Mines, observed unusual phenomena in the growth of plants in the area on which dust from the mills grinding asbestos fell. On investigation by the Milton Hersey Co. of Montreal and by Macdonald Agricultural College at Ste. Anne de Bellevue, it has been ascertained that the dust produced in the milling of asbestos has a distinct effect on certain types of vegetation and certain soils. It corrects soil acidity, which is a serious limiting factor in certain soils of Eastern Canada. There is said to be 50,000,000 tons of asbestos waste now on the dumps and it is accumulating at the rate of 1,000,000 tons per year. Macdonald College has undertaken further investigations, and Mr. Armstrong, on behalf of the Asbestos Corporation of Canada, is making a further study of the possibilities of rendering this material available for agricultural use.

Modern Treatment of Sewage

The Question of Manurial Value

At a meeting of the London Section of the Society of Chemical Industry held on Monday at Burlington House, Piccadilly, a paper on "Modern Developments in the Treatment of Sewage" was read by Mr. J. H. Coste, chief chemist to the London County Council.

The author gave a long and detailed account of some experiments carried out by him in 1921 with the activated sludge process of sewage disposal. In the discussion, some disappointment was expressed that the author had not been able to give comparative results of the different activated sludge processes that are available. It was also pointed out that there had been some important improvements in the process generally since the experiments were concluded. The chief feature of the discussion, however, related to the manurial value of activated sludge and the possibilities of turning it to commercial account.

The Chairman (Mr. C. S. Garland) said he had heard it stated that the manurial value of activated sludge was considerably greater than its proportions of nitrogen and phosphate would lead one to believe because of the humus in the sludge.

Dr. H. Calvert (Ministry of Health) remarked that an important claim in respect of activated sludge was that it was very much more valuable as a fertiliser than the sludge produced in the ordinary settling tanks. Perhaps the author would say whether he had conducted any experiments on that aspect of the problem. Some work had been done in this connection at Rothamsted and in America, and he believed that these experiments had substantiated this claim.

No Fortunes in It

Dr. A. Volcker said he did not believe that the manurial value of activated sludge would have any serious influence upon the development of the activated sludge process. It sounded very nice to speak of the manurial value of sewage sludge in any form, and perhaps there might be something in it when the sewage could be put direct on to the ground, as was the case in small villages and places where there was nothing but domestic sewage to deal with. In large industrial centres, however, the trade waste complicated the problem, and for this reason alone he did not think the manurial value of sewage would be a feature in the future. A large number of his friends had at various times thought there was a fortune to be made out of the manurial value of sewage sludge, but all their hopes had been disappointed, and he believed the same would be found to be the case with activated sludge.

Dr. W. R. Ormandy said he hoped Dr. Volcker's remarks would not be taken too literally and lead to a stoppage or hindrance of attempts to utilise sewage sludge as a manure. Farmers who were dealing with sandy land were looking for supplies of organic manure, and a friend of his in Ayrshire was having to transport organic manure a distance of 100 miles. In these circumstances it seemed incredible that a substance like activated sludge, which, according to the author's figures, contained some 50 to 60 per cent. of organic matter, 3 to 5 per cent. of phosphates, and 5 to 7 per cent. of nitrogen, should not be considered a valuable manure. The problem in relation to activated sludge for manurial purposes was the freight cost. As a matter of fact, the future held great possibilities in regard to the use of sewage sludge as a manure. At one sewage disposal works on the Continent sewage containing from 85 to 90 per cent. of water was used as feed water in a Brunler boiler which worked with a submerged flame and the sludge was expelled at the bottom of this small but efficient boiler in a state containing 50 to 60 per cent. of water at such a high temperature that on being sent away on a moving band it nearly dried itself by its own internal heat.

Mr. G. Watson said that at Leeds the sludge was being dried on the ground until the water content was about 40 per cent. and then it was burned to an ash and used by the neighbouring farmers with success in lightening heavy soils.

Australian Castor Oil Industry

The cultivation of the castor oil plant in Western Australia will, it is reported, soon commence on a large scale. A sample of seeds from the plants were sent by the Western Australia Government to an English firm in London for approval, and were stated to be 100 per cent. sound, possessing an average oil content of 53·96 per cent. Another favourable point was the small percentage of fatty acids.

Pharmaceutical "Analysts"

To the Editor of The Chemical Age.

Sir,—My attention has been drawn to an editorial which appeared in your issue of December 18, under the title "Pharmaceutical 'Analysts.'" Had this article been a private contribution no pharmacist would have paid any attention to it, but under the circumstances I wish to point out that it not only misrepresents the actual facts but even imputes serious incompetence to chemists in their profession.

Chemical analysis as a science has been framed and developed by pharmacists and it remains to this very day the main part of a pharmacist's training and occupation. The very standards for analysis have been established by pharmacists, with very little assistance or contribution from outside sources, and have been made official by inclusion in Pharmacopœias and the British Pharmaceutical Codex.

We are surprised that anyone, however little acquainted with the history of analytical chemistry, should overlook such patent and undeniable facts. There is no need to elaborate this point any further. With the very recent development of "Chimotherapy," physiological tests, the value of which is not quite established yet, may have to be added to the existing methods of chemical analysis, in which case a new field for what might be called "amphibious professions"—medico-chemical—will be opened. Thus a situation will be created in which pharmacists will have to consider if this branch should be taken up exclusively by themselves or left to the less skilled hands of medical men who dabble in chemistry. Taking advantage of this position the writer of your editorial seems to suggest that a body of unqualified chemists who encroach upon the legitimate occupation of pharmacists, concerning analysis, are the only people who should perform analytical work, and further betrays great ignorance of the training of pharmacists by insinuating that they are not capable of performing chemical tests and are simply bookworms.

I think it is only fair to impress upon any of your readers who may have been misled by such statements the fact that ever since analysis has been practised it has been the pharmacist's chief occupation and it is a *job only* for pharmacists; except in cases of very technical analysis or research analysis which requires very special instruments.

In anticipation of your courtesy in rectifying any misunderstanding which may have been created by this article, I remain, etc.,

J. Cofman-Nicoresti,
Member of the Pharmaceutical Society of Great Britain.

London, January 3.

[The description in the first and third paragraphs of this letter is one that we quite fail to recognise as a definition of our attitude, which may generally be described as a plea that chemical analysis is the function of a qualified (not unqualified) analytical chemist. In one sentence Mr. Cofman-Nicoresti declares analysis to be the "pharmacist's chief occupation" and "a *job only* for pharmacists"; in the next he himself specifies two classes of analysis that he considers pharmacists unqualified for. If his theory that analysis is "a job only for pharmacists" is good, there is obviously no need of a Society of Public Analysts, and the important offices of city or public analyst would become the preserve of the pharmacist. If this is what he really means, we should like to hear the views of the Institute of Chemistry or the Society of Public Analysts on the theory. —Ed., *C.A.*]

Physical and Optical Societies' Exhibition

The annual exhibition of the Physical Society and the Optical Society, comprising electrical, optical, and other physical and chemical apparatus, was held on Tuesday, Wednesday, and Thursday of this week at the Imperial College of Science and Technology, South Kensington, London. Nearly 80 firms exhibited apparatus. A feature of the exhibition was the increase which is shown in the production of recording apparatus, a very large variety of which was on view on the stands of a number of firms. In our next issue a more detailed account of the exhibits will appear.

Low Temperature Carbonisation

New Plant to be Erected

THE general meeting of Low Temperature Carbonisation, Ltd., was held on December 31 in London. Sir Arthur Wheeler, Bt., chairman of the company, presided. He said that the company had, since the sanction of the scheme of reorganisation, commenced operations with an entirely new board nominated by the committee of shareholders and the underwriters of the Prior Lien Debenture Stock. The finances had been entirely reorganised. The company was starting with a clean slate. Recognising that the undertaking was of national importance, the board realised that their first duty was to construct a plant capable of giving commercial results. The technical efficiency of the Parker process had been successfully proved under the tests of the Government Fuel Research Board. The old plant was not sufficiently large, and in the latter part of its operation developed defects for which improvements had been devised, so it had been decided to dismantle it and to erect a plant of sufficient capacity to give commercial results. The new plant had been carefully designed and standardised by the company's consulting engineers along with Mr, Charles Parker, so as to eliminate all weaknesses. Contracts had been placed with two eminent firms for the building of the retorts, settings, and the requisite engineering outfit. The total cost of the new works, including erection, had been estimated at £75,000, thus leaving a balance which the board believed was ample for working capital.

The company should be turning out between 400 and 500 tons of "Coalite" per week, with the other by-products, by the end of May. When the whole plant had been completed they felt no doubt that, apart from the continuous production of 1,000 tons per week of a perfect domestic fuel, the process would be able to show large profits from its production of fuel oil, motor spirit, sulphate of ammonia, and rich gas, which latter they anticipated would have an enormous influence upon the cost of the generation of electric power.

The five members of the present board and the auditors were unanimously re-elected.

Potash Monopoly

THE potash agreement between the French and German producers of potash was signed on Thursday, December 30, and it is expected to result practically in a world monopoly for the signatories. A campaign has been planned by them to educate farmers to use more potash, and they state they look for their profits more to increased sales than to enhanced prices. Profits are to be divided as to 70 per cent. to the German producers and as to 30 per cent. to the French, until the sales exceed 940,000 tons, when they will share the market equally. The respective Governments have agreed to allow the negotiators of the agreement the exclusive monoply for the sale of potash in their countries, while the French Minister of Agriculture has promised French farmers to do all within his power to obtain cheaper fertiliser.

Frankland Memorial Prize and Medal

ACTING on a suggestion of the Bristol and South-Western Counties Section, and the motion of Professor E. C. C. Baly, the Bristol and South-Western Counties Section of the Institute of Chemistry has decided to institute, in memory of Sir Edward Frankland, first president (1877-1880), an annual medal and prize of ten guineas for an essay by a registered student of the Institute. Competing students must be under twenty-two years of age, and the essay will be on a set subject of professional, as opposed to technical or purely chemical, importance. The essays will be valued partly for their literary style and technique, but mainly for the thoughts and ideas expressed. Further arrangements will be announced in due course.

Institute of Chemistry in New Zealand

THE INSTITUTE OF CHEMISTRY has, through its council, sanctioned the formation of a local section for the Dominion of New Zealand. The chairman of the section is Professor T. H. Easterfield, and the committee consists of the latter, together with Messrs. B. C. Aston, T. A. Glendinning, and J. Sword, with Mr. W. Rest Mummery as hon. secretary and treasurer. Mr. W. Donovan has been appointed hon. auditor.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

1. "We are anxious to obtain the names of English makers of paraformaldehyde."

2. "Can any of your readers supply particulars of the Parkington, or Parkinson, Duplex grinding mill?"

3. "A firm in New Jersey, U.S.A., supply sulphuretted hydrogen in cylinders. Do you know whether there is any firm in this country which can also supply this product in the same way? It would be most convenient for laboratory purposes."

Reply.—Several firms whom we have consulted report that they are unaware of its manufacture in this country. We understand, however, that during the war, Chance and Hunt, of Oldbury, near Birmingham, manufactured hydrogen sulphide in connection with the production of toxic gases, and that possibly it is being produced by a few firms on a laboratory scale. A well-known chemical engineer states that it can be readily generated in an ordinary plumber's hydrogen machine by using dilute sulphuric acid and iron sulphide.

4. "Can you tell us whether there is a quick means of testing the percentage of naphthalene in creosote, and whether the naphthalene would have any ill effect if the creosote were used for lubricating exhausters in gasworks?"

Reply.—A well-known gasworks chemist writes: "The best method of determining the solid bodies in creosote oil is to subject an average sample to refrigeration in a suitable freezing mixture: salt and nitrate of soda, or salt and ammonium nitrate can be used for this purpose. It will be appreciated that the solid matter which is deposited is not necessarily all pure naphthalene. It is really a complex. If the quantity of pure naphthalene must be determined, then one must resort to the ordinary naphthalene-picrate test, which is a standard method, and which can be found in any gas and analytical textbook. (See Dr. Weyman's *Gasworks Chemistry*.)"

"As regards the second question, I should strongly dissuade anyone from using creosote oil for the lubrication of exhausters in connection with gasworks. It is known that naphthalene is the bugbear of the gas engineer, and that invariably steps are taken at considerable expense to remove the naphthalene. To use creosote oil, which obviously will contain naphthalene, for lubricating purposes is merely to add to one's difficulties. The probabilities are that the crude coal gas reaching the exhausters is in a position to absorb naphthalene from the creosote oil used as a lubricant, and maybe the gas will become super-saturated, due to the influence of the lubricant, and will deposit its naphthalene at some point either on the works, or in the district, which may be a source of considerable trouble. If your correspondent is a gas engineer with a tar distillation works, and wishes to take advantage of some of his products for the lubrication of exhausters, then it would be infinitely better for him to use the latter fractions from the anthracene cut, *i.e.*, green oil, rather than creosote, which is suggested by the query."

5. "We should be obliged if you or your readers could furnish the names of suppliers of chromate of iron."

6. "We shall be glad if you will put us in touch with manufacturers of zinc chloride plants. We use 1,500 lb. weekly."

The B.I.F. Catalogue

A REMARKABLE feat in connection with the organisation of the British Industries Fair is the preparation by the Department of Overseas Trade of an advance overseas edition of the catalogue in English, French, German, Dutch, Swedish, Danish, Spanish, Italian, and Portuguese, which is to be ready seven weeks before the opening of the Fair on February 21. This catalogue, classifying and giving full particulars of the exhibits of the 800 firms in the London section, will be in the hands of trade buyers throughout Europe and North America a full month before they need to leave for England. Ten thousand copies are being printed, and there will be 30,000 copies of the main revised edition.

From Week to Week

THE WASHINGTON CHEMICAL CO., LTD., and Newalls Insulation Co., Ltd., held a dinner for the joint office staffs on December 30 at the Central Station Hotel, Newcastle.

MAJOR CHARLES ARTHUR MANDER, of Shifnal (of the firm of Mander Bros., paint and colour manufacturers, of Wolverhampton), has been appointed a deputy-lieutenant for Staffordshire.

THE NEW YEAR HONOURS LIST includes the following names: Mr. D. Milne Watson, LL.D., D.L., Governor of the Gas Light and Coke Co., a knighthood; Mr. H. T. Tizard, M.A., F.R.S., principal assistant secretary, Department of Scientific and Industrial Research, a C.B.

Official Chemical Appointments, the publication issued by the Institute of Chemistry, is now in preparation in a new edition. Corrections and suggestions which will increase its usefulness would be welcomed by the registrar, to whom all communications on the subject should be addressed.

MILDEW IN WOOL TEXTILE FABRICS can be detected by the application of ultra-violet light. An exhibit illustrating the method used was shown at the stand of the British Research Association for the Woollen and Worsted Industries at the exhibition of the Optical and Physical Societies in London this week.

RECENT WILLS INCLUDE: Mr. John Johnston Kirkpatrick, of Belfast, head of Kirkpatrick Bros., Ltd., bleachers, dyers, and finishers, a director of the Bleachers' Association, Ltd., of the Inver Bleach and Dye Works, and of other companies, £125,357.—Mr. Frederick N. Layman, manufacturing chemist, of Eastbourne, Sussex, and of Southwark Street, London, £63,062.

THE PRINCE OF WALES is to be present at the banquet which will be given by the Government at the Mansion House, London, on February 21, in celebration of the opening of the British Industries Fair in London and Birmingham on that day. Prompt booking by British manufacturers of all available space at the B.I.F. has enabled the organisers to publish a full catalogue of the London section six weeks in advance of the Fair.

THE ANGLO-GERMAN TRADE CONFERENCES will be resumed this spring, when, according to present arrangements, two separate British delegations will visit Germany. Sir Robert Horne (representing those interested in the Romsey conference) has accepted an invitation from Dr. Duisberg to go with his colleagues to Leverkusen in April, while Sir Max Muspratt, for the F.B.I., has accepted Dr. Duisberg's invitation for a return visit to Berlin in the late winter or early spring.

DENATURED ALCOHOL, that is, alcohol which has been rendered unfit for internal consumption by the addition of other substances, in order that it may be unfit for other than industrial use, is said to be giving rise to a great deal of difficulty in the United States. It is said that much of it is redistilled for the production of "whisky," and that many deaths have resulted from this use of it. It has been suggested that aldol should be used as a denaturant, instead of pyridine, which has been used hitherto.

MR. C. H. BIRKITT, B.Sc., will give a course of twelve lectures on rubber technology at the Northern Polytechnic, London, on Wednesday evenings, commencing January 19. Practical work will include the preparation of rubber mixes, manufacture of small rubber articles, and the use of testing apparatus. Fee, £1 for the course. For admission cards, application should be made to Dr. T. J. Drakeley, Department of Rubber Technology, Northern Polytechnic, Holloway, London, N.7.

ATHOLE G. ALLEN AND CO., chemical merchants, formerly of 604–605, Salisbury House, London Wall, announce that, in order to cope with increasing business, they have acquired larger premises, comprising up-to-date offices and warehouse on the River Thames. In consequence their address, as from January 1, 1927, has been Princes Wharf, 135, Grosvenor Road, Westminster, S.W.1. Telephone: "Victoria 7555" (two lines), private exchange; telegrams: "Athgallen Churton London."

HUNTINGTON, HEBERLEIN AND CO., LTD., 47/51, King William Street, London, have secured a contract for the supply of two sulphuric acid (oleum) plants of the latest type, one being for the Assam Oil Co. and the other for the Burmah Oil Co., Ltd. The tenders were open to foreign competition, and it is, therefore, particularly gratifying that a British firm of chemical engineers should have been entrusted with this work. The plants will be of British design and manufacture throughout.

APPLICATIONS ARE INVITED for the following appointments: Lecturers in Organic, Physical, and Bio-Chemistry in the Indian Institute of Science, Bangalore, Rs. 400-25-500 per month, plus house allowance. The Director. January 31.—Adviser in Agricultural Chemistry in the University of Manchester. £400. The Registrar. January 20.—Research Fellows (Physical or Inorganic Chemistry, or Physics) in the Department of Glass Technology of the University of Sheffield. £175-200. The Registrar. January 12.

MR. R. M. MACNAUGHT has been appointed managing director of the Lennox Foundry Co.

MR. F. C. COOKE has been transferred from J. Crosfield and Sons, Ltd., of Warrington, to A. and F. Pears, Ltd., of Isleworth.

HICKSON AND PARTNERS, LTD., state that, with a view to centralisation, their registered offices have been removed to the company's works, Ings Lane, Castleford.

MR. R. G. BROWNING has been appointed, in the place of Dr. O. L. Brady, resigned, to represent the Institute of Chemistry on the Aircraft Dope Ingredients Panel of the British Engineering Standards Association.

MR. J. G. MCLEAN has joined Industrial Combustion Engineers, Ltd., 31/37, Wybert Street, Munster Square, London, N.W.1. Mr. McLean from 1900 to 1911 was chief engineer and general manager of the Woking Electric Supply Co., Ltd.

PICRIC ACID, picrates, and mixtures of picric acid, subject to certain exceptions, have been declared explosives within the meaning of the India Explosives Act, 1884, by a notification recently issued by the Government of India in the Department of Industries and Labour.

JAMES ARTHUR SILVER, of Fairclough's Avenue, Warrington, died through injuries received while following his employment at the works of Joseph Crosfield and Sons, Ltd., soap and chemical manufacturers, Warrington. He was crushed between two railway wagons.

THE RUTGERSWERKE CO. has, it is stated, sold its licence for the production of tar from middle quality coal to the Leeds Fireclay Co. It is understood that this refers to a new system of low temperature carbonisation of coal to which great importance is attached. Plants are being extensively installed in Germany.

BRIGADIER-GENERAL H. HARTLEY, science tutor and fellow of Balliol College, Oxford, presided at the opening of the annual meeting of the Science Masters' Association. Over 400 members attended. General Hartley delivered his presidential address on "The Ionic Theory of the Solution of the Electrolytes."

MR. H. G. STEPHENSON, dyestuffs sales manager of E. I. du Pont de Nemours and Co. in New York, is retiring from that position. Mr. Stephenson joined the du Pont organisation in 1918 at the Boston office, and was transferred to the New York post in 1919. He will be succeeded in New York by Mr. G. Gillespie, of the Wilmington staff.

SIR WILLIAM ARROL AND CO. (SWANSEA), LTD., are closing their constructional works at King's Dock, Swansea, owing to the steel position. The important contracts recently secured by the company from South Africa and New Zealand, the value of which is approximately half a million pounds, will be transferred to the Glasgow branch, who are also taking over the services of certain members of the technical staff to deal with this work. The works at Swansea employ about 400 men.

INTERNATIONAL COMBUSTION, LTD., 11, Southampton Row, London, report the sale of the following: For England: one 6 ft. by 22 in. cylinder Hardinge conical ball mill for wet grinding limestone and clay; one 6 ft. by 48 in. cylinder Hardinge conical pebble mill for wet grinding feldspar and calcined flints; one five roller Raymond mill for grinding strontium. For India: one 12 ft. Gayco air separator for cement work. For France: one 4½ ft. diameter Hardinge conical ball mill, for grinding ochre sand; one five-roller Raymond mill for coal; one five-roller Raymond mill for Gafsa phosphate; one three-roller Raymond mill for bauxite; one No. 0000 Raymond pulveriser for para-nitraniline; one No. 00 Raymond pulveriser for carbonate of soda; one No. 00 Raymond pulveriser for ochre; one No. 00 Raymond pulveriser for plaster.

Obituary

MR. ARTHUR S. RIGBY, aged 62, of Runcorn, for over 30 years in the employment of the United Alkali Co., Ltd.

MR. THOMAS WARBURTON, O.B.E., aged 74, managing director of the Bleachers' Association. During the war he did valuable work in assisting the organisation of explosives supply.

MR. J. E. FRAZER, aged 26, lecturer in chemistry at Balliol College, Oxford. He was killed by a fall while competing in the British ski-ing championship at Davos, Switzerland, on Monday.

MR. CHARLES FREDERICK STOCKER, B.Sc., A.I.C., A.R.C.S., aged 27, of Bromley, Kent, works manager of the Medway Petrol Power Co. He was one of a ski-ing party overcome by an avalanche in the Austrian Tyrol on Saturday, January 1. Earlier in his career he was on the research staff of Vickers, and was in charge of that firm's exhibit at the British Empire Exhibition at Wembley.

MR. JOSEPH TAYLOR, of Meadow Bank, Tuck Lane, Huddersfield, dye chemist, aged 62. Mr. Taylor had lived in Huddersfield for 40 years and was for some time associated with the Colne Vale Dye and Chemical Co., of Milnsbridge. About 20 years ago he joined the United Indigo and Chemical Co., Ltd., and became head of the branch at Longroyd Bridge. Nine years ago he was made a director of the firm.

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The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

261,991. PURE POTASSIUM SALTS, PROCESS FOR PRODUCING. E. Niccoli, Ufficio Studii Giacimenti Saliferi di Bu-Kammasch, Tripoli. Application date, May 13, 1926.

Specification No. 247,245 (see THE CHEMICAL AGE, Vol. XIV, p. 279) describes the production of pure potassium salts from sea water. The sea salt contains sodium chloride, magnesium sulphate, double potassium and magnesium chloride, potassium sulphate, sodium bromide, etc. The raw mixed salt was dissolved in cold water to obtain a saturated solution, which was mixed with an equal volume of saturated magnesium sulphate solution to form a solution of 35° Bé. This solution was concentrated to 38° Bé, which, on crystallisation, yields a double sulphate of magnesium and potassium $K_2SO_4.MgSO_4.6H_2O$. By adjusting the conditions, it is possible to obtain a mother liquor which also contains the necessary magnesium sulphate without further addition. This result can now be obtained without dissolving the mixed salt, by treating it with insufficient cold water to form a complete solution. Part of the double potassium-magnesium sulphate passes into solution and is recovered in the next cycle, but the quantity is kept at a minimum by using water as cold as possible. The washing is effected in several stages, in the first of which sodium chloride, magnesium chloride, and a small quantity of potassium chloride are eliminated. Subsequent washings remove a large amount of chloride and a little double potassium-magnesium sulphate. The residue consists almost entirely of potassium-magnesium sulphate, which is then treated to obtain pure potassium sulphate.

262,157. PRODUCTS CONTAINING CELLULOSE, MANUFACTURE OF. C. Dreyfus, 8, Waterloo Place, London, S.W.1. Application date, June 6, 1925.

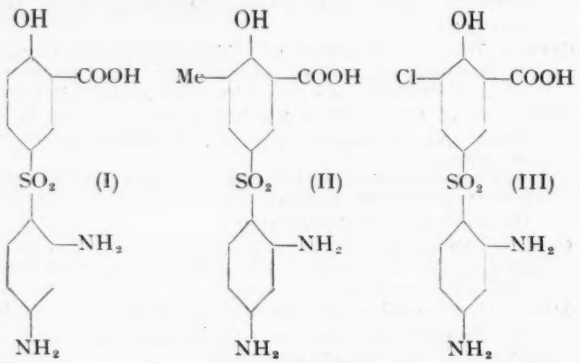
Cellulosic articles or materials are treated with a concentrated mixture of aqueous sulphuric acid and one or more aliphatic acids such as acetic, propionic, or formic acid. The acid mixture contains 5 per cent. or more of water and is subsequently removed by washing. The water may be present in the form of water-containing salts such as zinc chloride, sodium sulphate, aluminium sulphate, or aqueous alcohol. Products or articles treated in this manner appear as if they contain a permanent impregnation or finish, and the process can be applied to cotton fabrics, yarn, or paper, filter-paper, etc.

262,179. RUBBER, PRODUCTION OF. H. Beckmann, 26, Albertinenstrasse, Berlin-Zehlendorf, Germany. Application date, September 2, 1925. Addition to 240,430.

Specification No. 240,430 describes the production of a porous rubber, the latex to which sulphur or other vulcanising medium has been added, being converted into a homogeneous jelly by the addition of magnesium salts followed by vulcanisation under conditions which prevent the evaporation of the water in the pores. It is now found that acids and other known coagulants can be used for producing the jelly if allowed to act on the latex in gaseous form. Gaseous sulphur dioxide is particularly suitable. Acids and other coagulants can be used in liquid form if the latex is first mixed with substances which form a thick pulp without cohesion or elasticity. The pulp is moulded and subjected to the action of liquid acids. Suitable substances for thickening the latex include alum, zinc sulphate, iron chloride. The pulp may then be caused to set by the action of a concentrated solution of sulphur dioxide in water.

262,243. AZO DYESTUFFS. British Dyestuffs Corporation, Ltd., M. Mendoza, and K. H. Saunders, 70, Spring Gardens, Manchester. Application date, November 13, 1925.

Specification No. 245,865 (See THE CHEMICAL AGE, Vol. XIV, p. 184A) describes the production of diamines which are obtained by the reduction of the sulphones which are produced when sulphino salicylic acid, its homologues (*e.g.*, sulphino *o*-cresotinic acid) or substitution products *e.g.* (the sulphino halogen salicylic acids) act upon 2 : 4-dinitro-chlorbenzene. It is now found that diamines obtained as described in Specification No. 245,865 by the reduction of dinitrosulphones obtained by condensing these sulphinic acids with aromatic dinitro compounds are suitable for the end components of the monoazo or polyazo dyestuffs. The diamines mainly concerned are :—



These compounds are coupled with diazo compounds to obtain dyestuffs which give yellow to brown shades.

In an example, sulphanilic acid is dissolved in water and the solution run into dilute hydrochloric acid. The mixture is diazotised and the diazo suspension run into a solution of the diamino sulphone I dissolved in water containing soda ash. The dyestuff is salted, filtered off, and dried. The product dyes wool golden orange from an acid bath, becoming green on after-chroming. Golden orange shades are produced on cotton printed with a chrome mordant. Other examples are given.

262,301. COMPLEX ANTIMONY COMPOUNDS, MANUFACTURE OF. W. Carpmael, London. From Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 15, 1926.

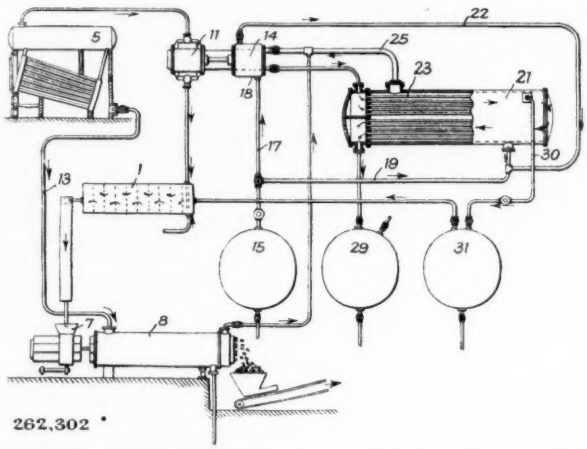
These compounds are obtained by the reaction of an antimonyl compound of a polyphenol containing two hydroxyl groups in the ortho position to each other, or a substitution product thereof, with a neutral salt of a mercapto-carboxylic acid. In an example, thioglycollic acid and caustic soda are treated with antimonyl pyrocatechol and the mixture heated. Most of the antimonyl pyrocatechol dissolves, and the solution is filtered and evaporated. The sodium salt of antimonyl pyrocatechol thioglycollic acid crystallises out and is then recrystallised. Mineral acids decompose the compound with the formation of a complex antimony thioglycollic acid containing about 40 per cent. of antimony. These compounds are employed for therapeutic purposes.

262,302. CARBONISING COAL AND CRACKING OIL, PROCESS FOR. W. E. Trent, 1131, Whitehall Building, 17, Battery Place, New York. Application date, February 15, 1926.

The process is for the production of smokeless solid fuel and liquid motor fuels. The solid fuel is obtained by mixing finely pulverised coal with the oil residue obtained when evaporating crude or fuel oil. This residue must contain a high percentage of asphalt or carbon so that the mixture with coal will bind together when baked, but not by simply briquetting and cooling. About 40 to 80 per cent. of the residue should vaporise on baking.

The coal and oil are mixed in a vessel 1 and exhaust steam is admitted from a boiler 5 through an oil vapour compressor cylinder 11 to the vessel 1. The mixture passes to a hopper 7 and thence to an oven 8. The fuel is there treated with hot gases from the boiler 5, which are admitted through a pipe 13. Crude oil is fed from a tank 15 through a pipe 17 to the jacket 18 of the oil vapour compressor cylinder 14 to control the temperature and pressure, but the main portion of the oil passes through a pipe 19 to the heat exchanger 21, to which the oil from the jacket 18 is also passed through a pipe 22.

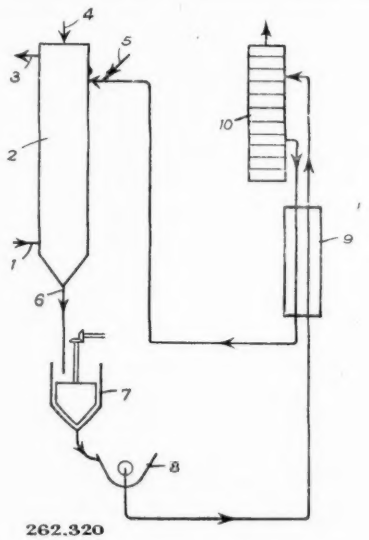
The tubes 23 receive the cracked and heated oil vapour from the compressor 14. Most of the liquid entering the heat exchanger is vaporised, and the vapour passes through pipe 25 to the compressor where it is subjected to a very high adiabatic compression which causes cracking. The cracked vapour condenses in the tubes 23, and the condensate is collected in a receiver 29. The oil supplied from the vessel 15 is maintained under vacuum to lower its vaporising point. The unvaporised heavy oil, tar, pitch, etc., is continuously withdrawn through a pipe 30 to a receiver 31 which supplies the mixing vessel 1. The temperature in the heat exchanger 21 is 500°–600° F. and the temperature in the oven 8 is 650°–700° F. The pressure in the compressor 14 is about 100 lb. per square inch.



262,302

262,320. Ammonium Sulphate, Process of Producing. Soc. Anon. des Fours à Coke Semet-Solvay et Piette, 100–101, Avenue de la Toison d'Or, Brussels. International Convention date, March 22, 1926.

The process is for producing ammonium sulphate by the action of calcium sulphate on the ammoniacal liquor obtained in the purification of coal or other gas. The partly purified gas, substantially free from ammonia but containing most of the acid impurities is treated with water to which pure gaseous ammonia is added to absorb carbon dioxide, sulphuretted hydrogen, and hydrogen cyanide. The resulting ammoniacal solution is treated with a suspension of calcium sulphate whereby it is freed from volatile acid constituents enriched in ammonia, and successively employed for treating the gases to be purified and the suspension of calcium sulphate. In the latter case, the solution is separated and heated to expel the volatile ammonium salts.



262,320

The gases pass through a purifier 2 from 1 to 3, water is introduced at 4 and pure gaseous ammonia at 5. The liquor is drawn off at 6 and is treated with calcium sulphate suspension in a mixer 7. The solids are separated in a filter 8, and the filtrate passed through a heat exchanger 9 to a still 10, where the volatile acids combined with ammonia are separated. The ammonium sulphate is cooled by passing through the heat exchanger 9 and returned to the top of the purifier 2. The solution is thus gradually enriched with ammonium sulphate.

262,306. Silicic Acid Gels, Manufacture of. W. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 19, 1926.

Silicic acid which has been precipitated with an excess of acid and while still in a state of jelly is treated with an alkaline substance and then dried. The jelly may be partly dehydrated by pressure or drying before or after treatment with the alkaline solution. The dehydration must not be such that a solid pulverisable gel is produced if the alkaline treatment is to follow. In an example, the silicic acid sol obtained by treating water glass with acid is broken up and treated with slightly more sodium carbonate solution than that necessary to neutralise the acid. The product is then washed and dried. The washing may precede the alkali treatment to economise in alkali.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—234,853 (L. P. Basset), relating to manufacture of metals or alloys in a revolving furnace, see Vol. XIII, p. 23 (Metallurgical Section) ; 246,156 (Soc. of Chemical Industry in Basle), relating to manufacture of a thioindoxyl derivative, see Vol. XIV, p. 311 ; 246,827 (S. I. P. Soc. Italiana Potassa), relating to separation of aluminium nitrate from potassium, sodium, iron, calcium and magnesium nitrates, see Vol. XIV, p. 361 ; 251,229 (Soc. Chimique des Usines du Rhône), relating to phosphoric esters of carbohydrates and polyvalent alcohols, see Vol. XV, p. 35 ; 255,466 (Chemische Fabrik auf Actien vorm. E. Schering), relating to diacylisothiourea S-alkylethers, see Vol. XV, p. 307 ; 256,950 (British Thomson-Houston Co.), relating to purification of gallium, indium, and similar metals and alloys, see Vol. XV, p. 39 (Metallurgical Section) ; 258,828 (Salzwerk Heilbronn Akt.-Ges., T. Lichtenberger, and K. Flor), relating to obtaining sulphur from alkaline earth sulphates, see Vol. XV, p. 528.

International Specifications not yet Accepted

260,604. Alkyl-naphthalenes. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, und Brüning, Hoechst-on-Main, Germany.) International Convention date, October 28, 1925.

These products are obtained by treating naphthalene or a derivative or substitution product with an alkyl halide at a raised temperature and under pressure or not, in the presence of a metal halide and an acid-binding agent such as zinc oxide, or magnesium oxide. Several examples are given. The product is fractionally distilled, and the substitution products separated. Low-temperature lubricating oils are obtained.

260,605. Synthetic Drugs. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, und Brüning, Hoechst-on-Main, Germany.) International Convention date, October 28, 1925. Addition to 241,767. (See The Chemical Age, Vol. XIII, p. 558.)

In an example of this process for obtaining alkamine esters of *N*-substituted *o*-aminobenzoic acid, sodium anthranilate is heated with β-chlorethylmethyl ether to obtain *N*-β-methoxy-ethyl-anthranilic acid. This is esterified with ethyl alcohol, and the ester heated with β-piperidino-ethanol in the presence of sodium ethylate. The product is dissolved in alcoholic hydrochloric acid, and ether added to obtain the monochloride of *N*-β-methoxy-ethylanthranilic acid β-piperidino-ethyl ester.

260,620. DEVULCANISING RUBBER. Soc. Italiana Pirelli, 21, Via Fabio Filzi, Milan, Italy. (Assignees of A. Mrach, 5, Piazza Fontana, Milan, Italy.) International Convention date, October 31, 1925.

Rubber scrap is ground and placed in a rotatable drum with caustic soda, potash, carbonates, sulphides or sulphites of 35°–36° Bé in slight excess over that corresponding to the sulphur in the rubber. The drum is rotated and heated rapidly to 135° C. and then slowly to 210° C. in seven hours. The vulcanised rubber is thereby regenerated.

260,623. HALOGENATED NAPHTHYL-THIOGLYCOLLIC HALIDES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, October 31, 1925.

These compounds are obtained by treating the naphthyl-thioglycollic halides with halogen, or a compound yielding halogen. Thus, 2-naphthyl-thioglycollic acid is treated with phosphorus trichloride in chlorbenzene to obtain the acid chloride, and then with sulphuryl chloride in presence of ferric chloride to obtain 1-chlor-2-naphthyl-thioglycollic chloride.

260,637. UTILISING WASTE RUBBER. B. F. Goodrich Co., 1780, Broadway, New York. (Assignees of H. Gray, 281, Volga Way, Akron, Ohio, U.S.A.) International Convention date, November 2, 1925. Addition to 249,172.

Ground vulcanised rubber scrap or reclaim is mixed with an organic sulphonyl chloride such as *p*-toluene sulphonyl chloride, and heated to about 140° C. for some hours. The product is a substance which softens at 60°–105° C., has a high mechanical strength and low dielectric constant. Crude rubber or rubber softeners may also be added to assist in the dispersion of the chloride.

LATEST NOTIFICATIONS.

263,070. Process for the production of celluloid-like masses. I.G. Farbenindustrie Akt.-Ges. December 21, 1925.

263,082. Process for obtaining light hydrocarbons from hydroxylated, carboxylated and like oxygenated organic compounds by the simultaneous action of heat, hydrogen under pressure and de-hydrating catalysts. Florentin, D., Kling, A., and Matignon, C. December 17, 1925.

263,088. Process for the production by dyeing of fast mixed shades on silk. I.G. Farbenindustrie Akt.-Ges. December 21, 1925.

263,117. Process for the sulphurising of fatty acids and their esters. Böhme Akt.-Ges., H. T. December 16, 1925.

263,119. Manufacture of lithopone. New Jersey Zinc Co. December 15, 1925.

263,120. Manufacture of lithopone. New Jersey Zinc Co. December 15, 1925.

263,124. Process for the production of cements. I.G. Farbenindustrie Akt.-Ges. December 15, 1925.

263,128. Manufacture of cellulose esters. I.G. Farbenindustrie Akt.-Ges. December 19, 1925.

263,142. Process for the production of 2-oxy-3-bromo-5-pyridine-arsinic acid. Binz, Dr. A., and Rath, Dr. C. December 21, 1925.

263,153. Process for the preparation of monocyclic ketones having more than nine ring members, and of their alkyl derivatives. Naef et Cie, M. December 15, 1925.

263,163. Manufacture of polycyclic compounds containing oxygen. I.G. Farbenindustrie Akt.-Ges. December 15, 1925.

263,164. Manufacture of azo-dyestuffs. I.G. Farbenindustrie Akt.-Ges. December 15, 1925.

263,169. Treatment of cotton fibres, preparatory to dyeing. Karrer, P. December 15, 1925.

263,175. Manufacture and production of oil lacquers and varnishes. I.G. Farbenindustrie Akt.-Ges. December 17, 1925.

263,178. Manufacture of condensation products of the anthraquinone series. I.G. Farbenindustrie Akt.-Ges. December 17, 1925.

263,179. Manufacture of thiomorpholines of the anthraquinone series. I.G. Farbenindustrie Akt.-Ges. December 17, 1925.

263,184. Manufacture and production of oil lacquers and varnishes. I.G. Farbenindustrie Akt.-Ges. December 17, 1925.

263,191. Process for the production of 2-amido-4-nitrophenoxy-ethanol, or-propandiol. Chemical Works (formerly Sandoz). December 19, 1925.

263,192. Process for the production of substantive dyestuffs of the stilbene series fast to alkali. Chemical Works (formerly Sandoz). December 19, 1925.

263,198. Process for the production of wide-porous active silica. I.G. Farbenindustrie Akt.-Ges. December 19, 1925.

263,199. Process for the production of active silica gels with fine capillary pores. I.G. Farbenindustrie Akt.-Ges. December 19, 1925.

263,200. Manufacture and production of vat dyestuffs of the benzanthrone series. I.G. Farbenindustrie Akt.-Ges. December 18, 1925.

Specifications Accepted with Date of Application

237,883. Gasification of solid fuel, Process and apparatus for—applicable also to volatilising or reducing ores. L. Chavanne. July 29, 1924.

239,878. Decamphorated oil of turpentine, Process for improving. Farbwerke vorm. Meister, Lucius, und Brüning. September 12, 1924.

240,814. Hydrocyclic-ω-amino methyl compounds, Manufacture of. H. Rupe. October 1, 1924.

242,620. Vat dyestuffs of the isodibenzanthrone series, Manufacture and production of. I. G. Farbenindustrie Akt.-Ges. (formerly Badische Anilin und Soda Fabrik). November 7, 1924.

243,026. Nitriles of benzanthrone, Process for producing. Kalle and Co., Akt.-Ges. November 17, 1924.

244,122. Barbituric acid derivatives, Manufacture of. J. D. Riedel Akt.-Ges. December 6, 1924.

252,160. Aluminium silicon alloys practically free from carbide, Process for the production of—by electrothermic means, Metallbank und Metallurgische Ges. A.-Ges. May 12, 1925.

254,729. Dextrose from starch-bearing materials, Method of producing. Corn Products Refining Co. January 17, 1925.

262,833. Phosphate fertiliser, Manufacture of. L. Adelantado. June 9, 1925.

262,878. Superphosphate, Process of manufacturing. B. Bodero. September 22, 1925.

262,901. Feeding solids into or removing solids from iron vessels under pressure, Process and apparatus for. J. Y. Johnson. (*Badische Anilin und Soda Fabrik.*) November 5, 1925.

262,918. Fluorine, Manufacture of. W. J. Tennant. (*Naamlooze Vennootschap Philips' Gloeilampenfabrieken.*) November 28, 1925.

262,938. Pure iron, Manufacture and production of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) December 14, 1925.

262,958. Intermediate products suitable for the preparation of azo-dyestuffs, Manufacture of. British Synthetics, Ltd., and E. B. Higgins. December 28, 1925.

263,018. Dinitrotoluene, Manufacture of. British Dyestuffs Corporation, Ltd., E. H. Rodd, and R. W. Everett. May 12, 1926.

263,034. Stannic acid or oxides of tin, Manufacture of. H. Harris. (*K. B. Heberlein.*) June 11, 1926.

Applications for Patents

British Celanese, Ltd. Phosphoric acid solutions of cellulose. 32,530. December 23. (United States, December 30, 1925.)

British Celanese, Ltd., and Kinsella, E. Manufacture of artificial silk, etc. 32,531. December 23.

British Dyestuffs Corporation, Ltd. Manufacture of derivatives from ligninsulphonic acid. 32,322. December 21.

Carpmael, W., and I.G. Farbenindustrie Akt.-Ges. Fungicides. 32,209. December 20.

Crichton, J. Apparatus for separating oil from water. 32,273. December 21.

Evans, Sons, Lescher, and Webb, Ltd. Holders for menthol, etc. 32,618. December 24.

Evans, W. E., and Kohlenveredlung Akt.-Ges. Distillation of carbonaceous, etc., substances. 32,434. December 22.

Franklin, R. G., and Synthetic Ammonia and Nitrates, Ltd. Production of methanol, etc. 32,483. December 23.

Gibbs, W. E. Apparatus for concentrating and evaporating liquids. 32,482. December 23.

Grouchkine, L. Diiodotrimethylamine product. 32,725. December 24.

Hailwood, A. J. Manufacture of derivatives from ligninsulphonic acid. 32,322. December 21.

Hall, A. J., and Silver Springs Bleaching and Dyeing Co., Ltd. Dyeing, etc., textile materials consisting of cellulose acetate silk. 32,374. December 22.

I G. Farbenindustrie Akt.-Ges. Production of active silica. 32,191. December 20. (Germany, December 19, 1925.)

I.G. Farbenindustrie Akt.-Ges. Production of active silica gels. 32,192. December 20. (Germany, December 19, 1925.)

I.G. Farbenindustrie Akt.-Ges. Production of benzanthrone dyestuffs. 32,194. December 20. (Germany, December 18, 1925.)

I.G. Farbenindustrie Akt.-Ges. Anthraquinone dyestuffs. 32,225. December 20. (Germany, December 23, 1925.)

I.G. Farbenindustrie Akt.-Ges. Production of anthraquinone dyestuffs. 32,301. December 21. (Germany, December 22, 1925.)

I.G. Farbenindustrie Akt.-Ges. Treatment of animal fibres. 32,421. December 22. (Germany, January 7, 1926.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs. 32,555. December 23. (Germany, December 23, 1925.)

Morgan, I., and Scottish Dyes, Ltd. Dyestuffs. 32,214. December 20.

Newport Co. Tetrakisazo dyes. 32,187. December 20. (United States, February 6, 1926.)

Plumbridge, D. V., and Salt Union, Ltd. Apparatus for concentrating and evaporating liquids. 32,482. December 23.

Soc. of Chemical Industry in Basle. Manufacture of dyestuffs. 32,693. December 24. (Switzerland, December 24, 1925.)

Steinschneider, L. Distillation of oils, etc. 32,598. December 23. (Czecho-Slovakia, January 15, 1926.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—About 7d. per lb. Crude 60's, 1s. 8d. to 1s. 10½d. per gall.

ACID CRESYLIC 99/100.—2s. 3d. per gall. Steady. 97/99.—2s. to 2s. 6d. per gall. Pale, 95%, 1s. 10d. to 2s. 6d. per gall. Dark, 1s. 9d. to 2s. 3d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 1s. 4d. to 1s. 5d. per gall., ex works in tank wagons. Standard Motor, 2s. to 2s. 3d. per gall., ex works in tank wagons. Pure, 2s. 3d. to 2s. 6d. per gall., ex works in tank wagons. Steady.

TOLUOLE.—90%, 2s. to 2s. 3d. per gall. Firm. Pure, 2s. 3d. to 2s. 6d. per gall.

XYLOL.—2s. 3d. to 2s. 6d. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6⅞d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8⅜d. to 9d. per gall.

NAPHTHA.—Crude, 10d. to 1s. 1d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 2d. per gall. Solvent 95/160, about 2s. per gall. Solvent 90/190, 1s. 3½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £8 per ton. Whizzed or hot pressed, £9 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £12 per ton. Quiet, Flaked, £12 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 112s. 6d. to 140s. per ton, according to district. Prices nominal.

PYRIDINE.—90/140, 12s. to 17s. per gall. Nominal. 90/180, 8s. 6d. to 9s. per gall. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. 6d. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—9½d. per lb. naked at works.

ANILINE SALTS.—9½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4d. to 4½d. per lb. Quiet.

m-CRESOL 98/100%.—2s. 3d. per lb. Fair inquiry.

p-CRESOL 32/34° C.—2s. 3d. per lb. Fair inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—9d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 per ton. Scarce. Grey, £17 5s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£8 5s. to £10 per ton and upwards, according to grade and locality. Very scarce and in fair demand.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—10d. to 11d. per gall. 16° Tw.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. to 4s. per gall., 60% O.P. Solvent, 4s. per gall., 40% O.P. Both scarce and in fair demand.

WOOD TAR.—£4 to £5 per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£41 to £42 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¼d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 6d. per lb. Firm.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.

ACID, BORIC B.P.—Crystal, £40 per ton; powder, £44 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 3½d. to 1s. 4½d. per lb., less 5%. Weak market.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.

ACID, SALICYLIC, B.P.—1s. 4d. to 1s. 5½d. per lb. Firm and good inquiry. Technical.—1s. to 1s. 0½d. per lb.

ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.

ACID, TARTARIC.—1s. 0½d. per lb., less 5%.

AMIDOL.—9s. 6d. per lb., d/d.

ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—11s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: lump, 1s. per lb; powder, 1s. 3d. per lb.

ASPIRIN.—2s. 4d. to 2s. 5d. per lb. Good demand.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—8s. 9d. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—12s. 3d. to 14s. 3d. per lb.

BISMUTH CITRATE.—9s. 3d. to 11s. 3d. per lb.

BISMUTH SALICYLATE.—10s. to 12s. per lb.

BISMUTH SUBNITRATE.—10s. 6d. to 12s. 6d. per lb., all above bismuth salts, according to quantity

BISMUTH NITRATE.—6s. 9d. per lb.

BISMUTH OXIDE.—13s. 9d. per lb.

BISMUTH SUBCHLORIDE.—11s. 9d. per lb.

BISMUTH SUBGALLATE.—9s. 9d. per lb.

BORAX B.P.—Crystal, £24 per ton; powder, £25 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 9d. to 1s. 10d. per lb.; sodium, 2s. to 2s. 1d. per lb.; ammonium, 2s. 2d. to 2s. 3d. per lb., all spot.

CALCIUM LACTATE.—1s. 4d. to 1s. 6d.

CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHER METH.—1s. 1d. to 1s. 1½d. per lb., according to sp. gr. and quantity. Ether purif. (Aether B.P., 1914), 2s. 3d. to 2s. 4d., according to quantity.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—6s. 6d. to 7s. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.

IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.

MAGNESIUM CARBONATE.—Light Commercial, £33 per ton net.

MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

MENTHOL.—A.B.R. recrystallised B.P., 18s. 9d. per lb. net; Synthetic, 11s. to 12s. per lb., according to quantity; Liquid (95%), 12s. per lb.; Detached Cryst., 15s. per lb.

MERCURIALS.—Red Oxide, 6s. 5d. to 6s. 7d. per lb., levig., 6s. to 6s. 1d. per lb.; Corrosive Sublimate, Lump, 4s. 8d. to 4s. 10d. per lb., Powder, 4s. 10d. to 4s. 11d. per lb.; White Precipitate, 4s. 10d. to 5s per lb., Powder, 4s. 11d. to 5s. 1d. per lb., Extra Fine, 5s. 1d. to 5s. 2d. per lb.; Calomel, 5s. 3d. to 5s. 5d. per lb.; Yellow Oxide, 5s. 10d. to 5s. 11d. per lb.; Persulph, B.P.C., 5s. 1d. to 5s. 2d. per lb.; Sulph. nig., 4s. 10d. to 4s. 11d. per lb.

METHYL SALICYLATE.—1s. 9d. per lb.

METHYL SULPHONAL.—15s. 6d. per lb.

METOL.—11s. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s 4d. per lb.

PHENACETIN.—3s. 9d. to 4s. per lb.

PHENAZONE.—5s. 9d. to 6s. per lb.

PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—82s. per cwt., less 2½% for ton lots. Dearer.

POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 6½d. per lb., spot.

QUININE SULPHATE.—2s. per oz., 1s. 8d. to 1s. 9d. per oz. in 100 oz. tins

RESORCIN.—4s. to 4s. 3d. per lb., spot.

SACCHARIN.—55s. per lb. Quiet.

SALOL.—3s. to 3s. 3d. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb. B.P.C., 1923—2s. to 2s. 1d. per lb. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb. carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—80s. to 85s. per cwt., according to quantity.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 1s. 11d. per lb. Crystal, 1s. 11d. to 2s. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—10s. 6d. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. to 2s. 2d. per lb.

THYMOL.—Purif., 11s. 6d. to 12s. per lb., according to quantity; natural, 17s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—8s. 3d. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—5s. 6d. per lb.

AMYL SALICYLATE.—3s. per lb.

ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 3d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 3d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 4d. per lb.

CINNAMIC ALDEHYDE NATURAL.—18s. per lb.

COUMARIN.—11s. per lb.

CITRONELLOL.—15s. per lb.

CITRAL.—9s. 6d. per lb.

ETHYL CINNAMATE.—10s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—9s. 9d. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—6s. to 10s. 6d. per lb.

HELIOTROPINE.—4s. 10d. per lb.

ISO EUGENOL.—13s. 6d. per lb.

LINALOL.—Ex Shui Oil, 12s. per lb. Ex Bois de Rose, 17s. per lb.

LINALYL ACETATE.—Ex Shui Oil, 15s. per lb. Ex Bois de Rose 18s. 6d. per lb.

METHYL ANTHRANILATE.—9s. 3d. per lb.

METHYL BENZOATE.—4s. 6d. per lb.

MUSK KETONE.—36s. per lb.

MUSK XYLOL.—8s. 6d. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—12s. per lb.

PHENYL ETHYL ALCOHOL.—11s. per lb.

RHODINOL.—28s. 6d. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—18s. 6d. to 19s. 6d. per lb.

Essential Oils

ALMOND OIL.—11s. 6d. per lb.

ANISE OIL.—3s. 3d. per lb.

BERGAMOT OIL.—31s. 6d. per lb.

BOURBON GERANIUM OIL.—12s. per lb.

CAMPHOR OIL.—63s. 6d. per cwt.

CANANGA OIL, JAVA.—20s. per lb.

CINNAMON OIL, LEAF.—5½d. per oz.

CASSIA OIL, 80/85%.—8s. 6d. per lb.

CITRONELLA OIL.—Java, 85/90%, 2s. 4d. per lb. Ceylon, pure, 1s. 11d. per lb.

CLOVE OIL.—6s. 6d. per lb.

EUCALYPTUS OIL, 70/75%.—2s. per lb.

LAVENDER OIL.—French 38/40%, Esters, 21s. per lb.

LEMON OIL.—9s. per lb.

LEMONGRASS OIL.—4s. 6d. per lb.

ORANGE OIL, SWEET.—9s. 9d. per lb.

OTTO OF ROSE OIL.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.

PALMA ROSA OIL.—10s. per lb.

PEPPERMINT OIL.—Wayne County, 25s. 6d. per lb. Japanese, 9s. 6d. per lb.

PETITGRAIN OIL.—8s. 3d. per lb.

SANDALWOOD OIL.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, January 6, 1927.

BUSINESS has been quiet during the past week, which is only to be expected in view of the stock-taking period. A forward view of the market, however, inclines one to more confidence than for some time past. Changes in price are few and far between. Export inquiry is better.

General Chemicals

ACETONE is unchanged at about £62 per ton.
ACID ACETIC is in fair demand at recent prices.
ACID CITRIC.—The market is lifeless and the price nominally 1s. 2½d. per lb.
ACID FORMIC is in good demand, and the price unchanged.
ACID LACTIC.—The price is about £45 per ton for 50% by weight.
ACID OXALIC.—The home trade demand is considerably better; price, 3⅜d. to 3¾d. per lb.
ACID TARTARIC.—There is nothing doing; holders are asking 11½d. per lb. and waiting for the market.
ALUMINA SULPHATE is in fair demand at £6 2s. 6d. to £6 5s. per ton for 17–18%.
AMMONIUM CHLORIDE is quiet at £18 15s. to £19 per ton.
BARIUM CHLORIDE is unchanged at £9 10s. to £9 15s. per ton.
COPPER SULPHATE is in rather better inquiry at £23 10s. to £24 per ton.
CREAM OF TARTAR.—The price is very firm and supplies for early delivery are short. Spot price £81 to £82 per ton.
EPSOM SALTS.—Unchanged at £5 10s. to £5 15s. per ton.
FORMALDEHYDE.—Slightly easier at £42 to £43 per ton.
LEAD ACETATE is in good demand at about £45 per ton for white and £43 for brown.
METHYL ACETONE is very firm at £58 to £60 per ton.
METHYL ALCOHOL.—Unchanged at £40 to £48 per ton.
POTASH CHLORATE is slightly easier at 3⅜d. to 3½d. per lb.
POTASH PERMANGANATE.—The price for high grade material is about 7½d. per lb.
POTASH PRUSSIATE is firm at 7½d. per lb.
SODA ACETATE is quiet at about £20 to £20 5s. per ton.
SODA BICHROMATE is in fair demand at 3½d. per lb.
SODA CHLORATE is in steady demand at 3¼d. to 3½d. per lb.
SODA NITRITE.—Unchanged at £19 15s. to £20 per ton.
SODA PRUSSIATE is very firm at 4⅜d. to 4½d. per lb.
SODA SULPHIDE.—Unchanged.
ZINC SULPHATE.—Unchanged.

Coal Tar Products

There is little change to report in the market for coal tar products since last week.

90's BENZOL is quoted at 2s. per gallon on rails, while the motor quality is worth about 1s. 10½d. to 1s. 11½d. per gallon.
PURE BENZOL is quoted at 3s. 9d. to 4s. per gallon.
CREOSOTE OIL is unchanged from last week, and is worth about 7½d. to 8d. per gallon on rails at works in the country, while the price in London is from 8⅞d. to 9d. per gallon.
CRESYLIC ACID is quoted at 2s. per gallon on rails for the pale quality 97/99%, while the dark quality 95/97% is worth about 1s. 11d. per gallon.
SOLVENT NAPHTHA is fairly easy, and is quoted at 1s. 8d. to 1s. 9d. per gallon on rails.
HEAVY NAPHTHA is unchanged, at 1s. 6d. to 1s. 7d. per gallon on rails.
NAPHTHALENES are also unchanged, the 76/78 quality being quoted at about £8 to £9 per ton, while the 74/76 quality is worth about £8 to £8 5s. per ton, at makers' works.
PITCH.—Little business is passing as buyers' idea of price is considerably below sellers' idea. To-day's value is approximately 120s. to 140s. per ton f.o.b. U.K. port.

Latest Oil Prices

LONDON.—LINSEED OIL steady but quiet at occasionally 2s. 6d. advance. Spot, £30 15s., ex mill; December, £29 7s. 6d.; January-April, £29 15s.; May-August, £29 12s. 6d.; September-December, £30. RAPE OIL steady. Crude extracted, £45 10s.; technical, refined, £47 10s., ex wharf. COTTON OIL quiet. Refined common edible, £38; Egyptian crude, £31 10s.; deodorised, £40. TURPENTINE nominal. American, spot, 58s. 9d.; February to June, 59s. 9d.; and July-December, 58s. per cwt.

HULL, January 6.—LINSEED OIL.—Naked, spot and January, £30 10s.; January-April, £30 7s. 6d.; May-August, £30 5s. COTTON OIL.—Naked Bombay crude, £31; Egyptian crude, £31 10s.; edible refined, £35 10s.; technical, £35; deodorised, £37 10s. PALM KERNEL OIL.—Crushed, 5½ per cent., £38, naked. GROUNDNUT OIL.—Crushed extracted, £41 10s.; deodorised, £45 10s. SOYA OIL.—Extracted and crushed, £34; deodorised, £37 10s. RAPE OIL.—Crude extracted, £44; refined, £46 per ton, net cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Nitrogen Products

Export.—The position has remained unchanged. As British producers do not appear to be offering freely on the export market, it seems that they are reserving supplies for the home consuming season. Quotations remain at £11 5s. to £11 7s. 6d. per ton, f.o.b. U.K. ports, in single bags, but they are largely nominal. No further reports have been received regarding the continental or American position.

Home.—It is expected that, on account of the lower price for sulphate, and the greater difference in the unit values of sulphate and nitrate, the home consuming season will be a heavy one. The prices announced by British producers in November last still hold good, and it appears unlikely that there will be any change. It is doubtful if the interest created by the manuring of grassland will appreciably affect the demand for sulphate this season.

Nitrate of Soda.—The recent reports of Messrs. Aikman and Henry Bath demonstrate that the Chilian producers are having a very bad year. Both these circulars emphasise that this is due to a great extent to the excessive price; nevertheless it is practically certain that producers will adhere to their price scale for the remainder of the season. On account of the recent rise in freight, the prices of nitrate to consumers are actually a little higher than last year. It seems likely, however, that despite the reduced production of nitrate there will be a huge stock carried over at the end of this season.

Calcium Cyanamide

ACTIVITY amongst merchants continues and inquiries for immediate deliveries are on the increase. The price announced for January is £9 12s. per ton, delivered in 4-ton lots, carriage paid to any railway station in Great Britain, making the price per unit of nitrogen 10s. 1d.

International Superphosphate Association

DELEGATES from France, Germany, Holland, Belgium, Sweden, Norway, Denmark, Poland, Czecho-Slovakia, Finland, the United Kingdom, and North and South Africa attended recently at a meeting held in London to inaugurate the International Superphosphate Manufacturers' Association. Other countries have also expressed their intention of joining. The offices of the Association will be in London. The objects are: To act as a medium for interchange of information between the members; to increase consumption of superphosphates by propaganda, etc.; to promote research and scientific work; and to promote co-operation with other groups of fertiliser producers. The output of superphosphate from countries represented in the Association is 5,000,000 tons, 10 per cent. of which is supplied by this country. The president of the Association is Mr. E. G. Martens, of London, the vice-presidents Messrs. Mathiasson (France), C. Scheibler (Germany), and M. Berr (France), and the honorary secretary and treasurer Mr. A. N. Gray, of the Fertiliser Manufacturers' Association, Aldwych House, London.

Position of Natural Nitrate

AIKMAN (LONDON), LTD., have issued their annual report on the market in nitrogenous fertilisers, and state that a considerable increase is expected in the production of synthetic nitrogen products during the year. Negotiations are going on for the construction of large plants in America, in association with German interests. It would appear, therefore, that a price war is fast approaching, and that prices of both synthetic nitrogen products and of by-products will be substantially reduced in the second half of 1927. This will be good news for the farmer, but will come as a shock to the holders of shares in the Chilian nitrate companies, who have to compete with the artificial product. It is considered by Aikman, Ltd., that whereas a reduction in the export duty might have been of great assistance a year or two ago, nothing short of the abolition of this duty can now save the industry.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, January 5, 1927.

THERE has been quite good inquiry for heavy chemicals, quantities called for also being fair. Prices show little or no change from those last reported.

Industrial Chemicals

ACID ACETIC, 98/100%.—£55 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 to £38 per ton; 80% technical, £37 to £38 per ton, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powder, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Price remains unchanged at about 7d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—In little demand, spot material quoted 1s. 3d. per lb., less 5 per cent. ex store on offer from the Continent at about 1s. 2¾d. per lb., less 5% ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—In moderate demand and price unchanged at about 3¾d. per lb., ex store, spot delivery. Price 3½d. per lb., c.i.f. U.K. ports, prompt shipment from the Continent.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In little demand and price unchanged at about 11¼d. per lb., less 5%, ex store. Offered for prompt shipment at 11⅛d. per lb., less 5% ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material on offer at about £6 per ton, ex store. Quoted £5 8s. 6d. per ton, c.i.f. U.K. ports. Prompt shipment from the Continent.

ALUM, POTASH.—Lump quality rather higher at about £8 10s. per ton, c.i.f. U.K. ports. Crystal powder, £8 5s. per ton, c.i.f. U.K. ports. Lump quality on spot offered at £9 5s. per ton, ex store. Crystal powder, £8 15s. per ton, ex store.

AMMONIA ANHYDROUS.—On offer for early delivery at 10½d. per lb., ex store. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powder, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £23 10s. to £24 10s. per ton, ex station. Continental make on offer at about £21 per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £18 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Spot material quoted £18 15s. per ton, ex store. On offer for prompt despatch from mines at £19 5s. per ton, ex wharf.

BARIUM CARBONATE.—98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals now quoted £8 2s. 6d. per ton, c.i.f. U.K. ports, packed in bags. Casks 7s. 6d. per ton extra. Offered for spot delivery at £9 15s. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4 ton lots. Spot material 10s. per ton extra. Continental now quoted £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—English material quoted £23 per ton, f.o.b. U.K. ports. Continental on offer at £21 10s. per ton, c.i.f. U.K. ports.

FORMALDEHYDE, 40%.—On offer for prompt shipment at £38 5s. per ton, c.i.f. U.K. ports. Spot material unchanged at £40 per ton, ex store.

GLAUBER SALTS.—English material quoted £4 per ton, ex store or station. Continental now offered at about £2 17s. 6d. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material now on offer at about £35 10s. per ton, ex store.

LEAD, WHITE.—Quoted £36 per ton, ex store.

LEAD, ACETATE.—White crystals quoted £44 per ton, c.i.f. U.K. ports; brown about £40 5s. per ton, c.i.f. U.K. ports. White crystals on offer at about £45 per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. in moderate demand.

POTASH, CAUSTIC, 88/92%.—Solid quality £27 5s. per ton, minimum 15 ton lots, c.i.f. U.K. ports. Smaller quantities 15s. per ton extra. Liquid quality, 50°, £14 per ton, c.i.f. U.K. ports, minimum 15 ton lots. Smaller quantities 7s. 6d. per ton extra.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE.—96/98% quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store. 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Powdered quality offered from the Continent at £24 10s. per ton, c.i.f. U.K. ports. Crystals £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—Rather cheaper quotations from the Continent. Now quoted £21 15s. per ton, c.i.f. U.K. ports. Spot material unchanged at about £24 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6¾d. per lb. ex store, spot delivery. On offer for early shipment at 6½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—In moderate demand, and price unchanged at about 7¼d. per lb., to 7⅜d. per lb., ex store. Offered from the Continent at 7¼d. per lb., ex wharf.

SODA CAUSTIC.—Powder, 98/99%, £19 7s. 6d. per ton. 76/77%, £15 10s. per ton. 70/72% £14 10s. per ton, carriage paid station, minimum four ton lots on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 10s. per ton, ex store. Continental on offer at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s, per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¼d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powder or pea quality, £1 7s. 6d. per ton more; alkali, 59%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture now quoted £9 2s. 6d. per ton, ex station, minimum 4 ton lots. Pea crystals, photographic quality, £14 10s. per ton, ex store, spot delivery. Continental commercial quality quoted £8 per ton, c.i.f. U.K. ports or £8 10s. per ton, ex store.

SODIUM NITRATE.—Ordinary quality quoted about £12 12s. 6d. per ton, ex store. Refined quality 5s. per ton extra.

SODIUM NITRITE, 100%.—£21 5s. per ton, ex store, spot delivery.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at 4¼d. per lb., ex store, spot delivery. Offered for prompt shipment from the Continent at a fraction less.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE. 60/65%.—Solid, £12 10s. per ton; broken, £13 10s. per ton; flake, £14 10s. per ton; crystals, 31/34%, £8 10s. per ton and £9 per ton, according to quality, delivered buyers' works, minimum 4 ton lots, on contract. Price for spot 5s. per ton, extra for solid, 2s. 6d. per ton, extra for crystals. 60/62% solid quality offered from the Continent at about £9 7s. 6d. per ton, c.i.f. U.K. ports; broken 15s. per ton extra.

SULPHUR.—Flowers, £12 5s. per ton; roll, £11 per ton; rock, £11 per ton; floristella, £10 10s. per ton; ground American, £9 15s. per ton. Ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material 98/100% quoted £24 15s. per ton, f.o.b. U.K. ports. 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some home inquiries.

BETA NAPHTHOL.—11d. to 1s. per lb., Some home inquiries.

TOBIAS ACID.—3s. 2d. per lb., per 100%. Some home inquiries.

METANITRANILINE.—3s. 1d. per lb., per 100%. Some home inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, January 6, 1927.

So far with the turn of the year there has been no marked improvement in the volume of business transacted on the Manchester chemical market, although quite a fair trade is being done in several of the bread-and-butter lines. The market is more cheerful and it is not improbable that more active buying will be seen when there has been a general settling down during the next few weeks. Continental demand at the moment is slow, and not a great deal has been done this week on general overseas account. Meanwhile prices are steady pretty well all around.

Heavy Chemicals

Supplies of prussiate of soda are still on the short side, and it is this factor rather than any pressure of demand that is keeping prices very firm, quotations being between 4¼d. and 4½d. per lb. Saltcake meets with a certain amount of inquiry and makers' prices have been increased by 10s., current values now being £3 10s. per ton. There is not much stirring in the case of Glauber salts, but prices remain at about £3 15s. per ton. Contract deliveries of bleaching powder are now being made at the reduced rate of £8 per ton, buying at present being on a rather quiet scale. Sulphide of soda keeps steady, although there is not a great deal of inquiry for it; 60-65 per cent. concentrated solid is offering at £10 5s. per ton and commercial material at £7 15s. For caustic soda there is a quietly steady demand at from £14 10s. per ton for the 60 per cent. quality to £16 10s. for the 76 per cent. Phosphate of soda is only in limited request, but values are maintained at £12 10s. to £12 15s. per ton. Alkali is in fair inquiry at round £6 10s. per ton. Chlorate of soda is on the quiet side, although offers are still being made at about 3d. per lb. Bichromate of soda is currently quoted at 3¼d. per lb. and a moderate demand is reported. Prices for bicarbonate of soda have not been altered, values still being round £10 10s. per ton, and a fair business being done. Nitrite of soda is steady, although in quiet demand at about £19 10s. per ton. Hyposulphite of soda is in limited request at about £15 5s. per ton for photographic material and £9 15s. for commercial.

Yellow prussiate of potash continues firm on scarcity, about 7¼d. per lb. still being quoted. Chlorate of potash is quiet and values have a somewhat easy tendency, round 3½d. per lb. being asked. Caustic potash is in fair request at round £29 per ton. Carbonate of potash is steady and meets with some inquiry at £26 to £26 5s. per ton. Permanganate of potash is displaying a certain amount of weakness and demand is on a small scale; B.P. quality is quoted at about 6¼d. per lb. and commercial at 5d. Bichromate of potash is not particularly active, but about 4½d. per lb. is still about the basis of transactions.

A rather improved demand and continued short supplies have the effect of keeping arsenic very firm, current quotations being £17 to £17 5s. per ton at the mines for white powdered, Cornish makes. Sulphate of copper is also very well maintained at £24 5s. per ton, f.o.b., a better demand on export account being reported. Nitrate of lead is rather quiet but prices are still round about £40 per ton. There is not much inquiry for the acetates, but values in all cases remain fairly steady, acetate of lead being quoted at £44 10s. to £45 for white and £41 for brown, and acetate of lime at £17 5s. for white and £9 for brown.

Acids and Tar Products

Citric acid remains quiet and easy at 1s. 3d. to 1s. 3¼d. per lb. Tartaric acid is in limited demand, but at 11½d. per lb. there has been little change in prices. Acetic acid continues to attract a fair amount of interest and values are maintained at £37 10s. per ton for 80 per cent. commercial and £66 for glacial. Oxalic acid is steady and in moderate request at 3⅜d. per lb.

Pitch prices are displaying some uncertainty; supplies are still very limited and current values range round £5 17s. 6d. per ton, f.o.b. Solvent naphtha is maintained at round 1s. 10d. per gallon, although there is only a quiet demand for this just now. Supplies of creosote oil are still exceedingly scarce and prices are firm at 8¼d. per gallon. For carbolic acid crystals about 6⅞d. per lb. is being quoted.

British Cyanides Co.

Development of New Industries

At the annual general meeting of the British Cyanides Co., Ltd., in London, on Tuesday, Mr. C. F. Rowsell (chairman), after reviewing the circumstauces which had made it necessary to reorganise the capital, moved the adoption of the report.

Mr. Kenneth M. Chance (managing director), in seconding the motion, said that by far the most important factor in the situation was that for the development of their new industries they must control a cheap supply of thiocarbamide, for which cheap sulphocyanide was required; therefore, the contracts with gasworks must be maintained. To do that, the surplus must be disposed of, and that could only be done by making it into prussiate of soda and selling it as such. After referring to the fact that the price of this chemical had recently improved, Mr. Chance said that they were not parties to any arrangement that might have been made, but he wanted to take that opportunity to state publicly that for some time yet they were bound to have prussiate of soda to dispose of, and that they would endeavour to dispose of it in such manner as would cause the least inconvenience to other manufacturers.

The manufacture of moulding powders by the Beetle Products Co. had already reached the commercial stage. Those mouldings could be purchased at Harrods, and before Christmas the demand for them was unexpectedly heavy. Considering that the moulding firms who turned them out had been totally unprepared for the rush of orders, it was greatly to their credit that they had been able to provide stock from which over £1,000 worth had been sold at Harrods during the four weeks ended with Christmas Day. With such a start as that, the rapid development of that new industry should be assured. They had also now got white moulding powders which were being sold freely for a number of purposes.

The report was adopted after a brief discussion.

At an extraordinary general meeting that followed, resolutions authorising the reorganisation of the capital of the company in the manner already made public were carried by the requisite majority.

Separate meetings of the preference shareholders and the ordinary shareholders were then held. In neither instance was a quorum present, and the meetings stood adjourned until January 19 next.

Standard Specifications for Paints, Varnishes, etc.

The British Engineering Standards Association has just issued five new British Standard Specifications for red oxides of iron for paints, zinc oxide oil paste for paints, white lead and tinted white lead ready mixed paint and extra hard drying varnish. They contain clauses regulating the composition, together with standard reception tests, for the purchase of these materials, together with appendices giving methods of carrying out the tests. These specifications have been prepared at the request of the paint manufacturers by a committee representative of both the buying and manufacturing interests, and as in the case of all British Standard Specifications they will be reviewed as experience of their working or progress in the industry renders it necessary, and revised issues will be published from time to time. Amongst other specifications in hand, which will be published as completed, are the following:—Red oxide of iron oil paste (class 1 and 2), lead chromes, Prussian blues, lithopone, lithopone oil paste, carbon black, gold size, zinc oxide and tinted zinc oxide ready mixed paint.

Copies of these five new specifications (Nos. 261, 262, 272, 273, and 274—1926) can be obtained from the B.E.S.A. Publications Department, 28, Victoria Street, S.W.1, price 2s. 2d. each, post free.

Offer of Australian Representation

Mr. Fred F. Doward, representing the Australian firm of A. Victor Leggo and Co., is at present in London, and wishes to hear from British manufacturers of industrial chemicals and machinery for rubber manufacturers and road-making, with a view to their Australian and New Zealand representation. Letters can be sent care of the Royal Bank of Australia, 18, Bishopsgate, London, E.C.

Company News

EASTWOODS, LTD.—The directors announce an interim dividend of 7½ per cent., actual, less tax, on the ordinary shares.

B. LAPORTE, LTD.—The half-yearly dividends on the 6 per cent. preference shares and the 7½ per cent. "B" preference shares were paid on December 31.

EGYPTIAN SALT AND SODA CO.—A dividend of 1s. per share, less tax, for the year ended August 31 last, will be paid on and after January 10. A similar rate was paid for the preceding year.

ALLEN-LIVERSIDGE, LTD.—An interim dividend on the ordinary shares, is payable on January 24, on account of the six months ended October 31 last, at the rate of 10 per cent. per annum, less tax.

BLUNDELL, SPENCE AND CO.—The directors recommend a dividend at the rate of 8 per cent. per annum on the ordinary shares, placing £1,000 to the Longstaff pension fund and £1,500 to bad debt account, leaving £22,672 to be carried forward.

BRITON FERRY CHEMICAL AND MANURE CO., LTD.—In view of the fact that the coal strike continued for a much longer period than was anticipated, and the consequent effect upon the business of the company, the directors have decided further to defer consideration of a dividend in respect of the year to December 31 on the 7 per cent. cumulative preference shares until early in March, when results of the year's working will be definitely ascertained. With the settlement of the strike the directors report that demand is expanding, but it must necessarily be some time before far-reaching after-effects are overcome and trading conditions approach normal.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICALS AND RAW MATERIALS.—A representative of a well-known importing and manufacturing concern, with branches throughout Australia, is at present in the United Kingdom, and is endeavouring to get into touch with manufacturers in Great Britain who require representation in Australasia. The lines of special interest to his firm are chemicals and raw materials for all industries, especially tanners and leather dressers, textile industries (woollen mills and knitting mills), rubber manufacturers, glass manufacturers, paint and varnish industry, confectionery machinery, rubber manufacturing machinery, road-making machinery. Inquiries should be addressed, in the first instance, to the Commercial Bureau, Australia House, Strand, W.C., quoting Reference 414.

CAUSTIC SODA, ETC.—A European firm of manufacturers' agents and merchants in Madras are prepared to undertake the representation in that presidency of British firms. (Reference No. 1.)

COPPER SULPHATE, METAL WIRE, ETC.—The Polish Post Office are inviting tenders, to be presented by January 15, 1927, for the supply of various materials, including silicon bronze line wire, soft bronze wire, aluminium links and crystals of sulphate of copper. (Reference A.X. 4049.)

CHEMICALS.—A firm of agents established in Stockholm desires to obtain the representation of British exporters of the following goods:—Chloride of lime, glauber salt, caustic potash, caustic soda, gypsum, resin, China Clay, and potato starch. (Reference No. 16.)

New Paint Research Laboratory

ARRANGEMENTS have been made to purchase a property at Teddington near to the National Physical Laboratory, to be used as the research station and laboratories of the Paint, Colour, and Varnish Research Association. It is hoped that the premises will be ready for occupation by the end of March. A technical advisory committee was appointed at a meeting of the Council held on Tuesday to consider and draw up the preliminary programme of research. A second member of the technical staff has been appointed, viz., Dr. J. O. Cutter, Ph.D.

Tariff Changes

NORTHERN RHODESIA.—A recently issued Ordinance (No. 17 of 1926), entitled the "Opium and Habit-forming Drugs Regulation Ordinance, 1926," provides for the control of the production, manufacture, import and export, sale, etc., of drugs such as raw, medicinal and prepared opium, opium, morphine, diamorphine (heroin), coca leaf, crude cocaine, ecgonine, Indian hemp, etc.

JAMAICA.—Under Item 8 of the Schedule of Customs duties applicable in Jamaica, cement, i.e., Portland cement, which conforms to such standards as may be fixed by the Governor in Privy Council may be admitted into the Colony at rates of duty considerably lower than those applicable to cement which does not conform to a standard so prescribed. A standard for cement has now been fixed by the Governor in Privy Council on October 18 and published in the *Jamaica Gazette* for October 28.

Fraud Charge Against Chemist

ROBERT BROWNLOW, 49, industrial chemist and engineer, of no fixed home, was charged on remand at Bow Street on Friday, December 31, 1926, with fraudulently incurring a debt of £5,000 to Emil Otto P. F. Schwarz, and with obtaining credit without disclosing that he was an undischarged bankrupt. Mr. H. A. K. Morgan, for the Director of Public Prosecutions, said that in September last Brownlow was trading as the Hendon Scientific Laboratories at Hendon. Mr. Schwarz got into communication with him through an advertisement. Mr. William Ormiston, Official Receiver for Bristol, said Brownlow was adjudicated bankrupt at Bath on January 5, 1923, upon a creditor's petition, with unsecured liabilities of £3,544. The assets realised £110. Brownlow admitted that he had twice previously been made a bankrupt. He had not secured his discharge in respect of any of the three bankruptcies. Opposing an application for bail, Detective-Sergt. Mugridge said he had reason for believing that, if set at liberty, Brownlow might interview witnesses whom the police wished to question in regard to other charges which might be preferred. Mr. Morgan mentioned that the works at Hendon had now been closed. Mr. Handcock said that Mr. Schwarz parted with his £5,000 after he had inspected the works and full investigation had been made. The laboratories were still at Hendon. Bail was refused.

Chemical Merchants' Bankruptcy

IN the compulsory liquidation of Balfour, Campbell and Co., Ltd., of 13a, Eastcheap, London, E.C., which has carried on business as merchants in coal tar products, chemicals, tin, and copper, the statutory meetings of the creditors and of the shareholders were held on Monday at the Board of Trade Offices, London. The statement of affairs returned the liabilities at £16,825, with a total deficiency of £20,819 with reference to the shareholders. The winding up order was made on November 9 on the petition of a creditor. The company was registered in March, 1922, with a nominal capital of £5,500. The first directors were Messrs. A. A. Lyon and R. Bode. Mr. Lyon was now returned as an unsecured creditor for £13,163, the bank overdraft standing at £5,376. The failure and insolvency of the company were attributed by the directors to the speculative nature of the company's business. There was no prospect of any dividend to the unsecured creditors. The meetings resulted in the liquidation remaining in the hands of the Official Receiver.

Sir Max Muspratt on Future Prospects

IN the course of a New Year message, Sir Max Muspratt (President of the Federation of British Industries) says:—"The heavy trades have demonstrated their ability to carry on in face of great difficulties, and they will enter upon the New Year with their productive capacity unimpaired. Further large contracts have been placed with British firms. These facts, coupled with the psychological effect of the end of the coal strike and the satisfactory results of the Imperial Conference, incline one to look forward hopefully, as I do. At the same time, it would be foolish to overlook the possibilities that the continued decline in exports in the post-war period may not mean that some permanent change is taking place in the relative importance of the exporting and home trades."

The INTERNATIONAL OIL, CHEMICAL AND COLOUR TRADES EXHIBITION

Royal Agricultural Hall, London,

June 11th to 18th, 1927

1927 Promises Well

Take advantage of improving trade by being represented in the first Trade Exhibition held for ***YOUR*** *Industry.*

Organisers :

THE INTERNATIONAL TRADE EXHIBITIONS Ltd.

Broad Street House, Old Broad Street, London, E.C.2

Telephone : London Wall 0956 and 0957. Telegrams and Cables : "Promenade, Ave, London."

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Bill of Sale

PHILLIPS, David John, San Marino, 28, Upper Tooting Park, Balham, manufacturing chemist, etc. (B.S., 8/1/27.) Filed January 3. £250.

Receiverships

BOLTON CHEMICAL PLANT MANUFACTURING CO., LTD. (R., 8/1/27.) P. O. Carter, of 14, Wood Street, Bolton, C.A., was appointed receiver and manager on December 21, 1926, under powers contained in debenture dated June 21, 1924.

FREESOL CO., LTD. J. H. Senior, of 7, Adam Street, Adelphi, W.C.2, ceased to act as receiver or manager on December 8, 1926.

NATIONAL COLOURS, LTD. (R., 8/1/27.) P. O. Carter, 14, Wood Street, Bolton, C.A., was appointed receiver and manager on December 31, 1926, under powers contained in debenture dated June 21, 1924.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

EVANS, SONS, LESCHER AND WEBB, Liverpool, manufacturing chemists. (M., 8/1/27.) Registered December 17 (by order on terms), two conveyances and two assignments of equities of redemption from old company to new company, securing £14,000, £15,000, £2,000 and £10,000, respectively, to G. H. Burroughs, The Knowle, Prenton, and others; Mrs. E. A. Yerburgh, 25, Kensington Gore, W., and others; said Mrs. E. A. Yerburgh and others, and G. C. Nickels, Wolverton, Enfield, and another; charged on 58, Hanover Street, premises in Wood Street, etc., 14, 16, and 18, Concert Street, and 18 and 20, Seel Street, all Liverpool.

HAMILTON'S OIL CONCESSIONS (ROUMANIA) LTD., London, E.C. (M., 8/1/27.) Registered December 23, £10,000 debenture to Spies Petroleum Co., Ltd., 65, London Wall, E.C.; charged on 40,000 shares of 500 Lei each in Sondrum Societate Petrolifers Anonima Romana, also general charge. *Nil. May 18, 1925.

HARRISON, BLAIR AND CO., LTD., Kearsley, chemical manufacturers. (M., 8/1/27.) Registered December 18, £10,000 debentures, to Bank; general charge. *Nil. February 24, 1926.

RENNY FORBES AND CO., LTD., Alperton, chemical manufacturers. (M., 8/1/27.) Registered December 20, £2,500 debentures; general charge. *£4,500. May 21, 1926.

London Gazette, &c.

Company Winding Up Voluntarily

BUCKNALL CHEMICAL PRODUCTS, LTD. (C.W.U.V., 8/1/27.) By special resolution, December 2, confirmed December 23. C. V. Booth, 17, Victoria Street, London, S.W.1, appointed liquidator. Meeting of creditors at liquidator's office, on Wednesday, January 12, at 11 a.m. Note.—All creditors have been, or will be, paid in full.

Notices of Dividends

BOOTH, Thomas Arthur, Louisa Street, Idle, Bradford, wholesale manufacturing druggist. Second and final dividend, 2s. 10d. per £, payable January 13, Palmerston Buildings, 5, Manor Row, Bradford.

ROTH, James Bertram, trading as J. B. ROTH AND CO., 21, Cannon Street, Manchester, chemical and colour merchant. First and final dividend, 1s. 4d. per £, payable January 10, Official Receiver's Offices, Byrom Street, Manchester.

Order Made on Application for Discharge

ROTH, James Bertram, trading as J. B. ROTH AND CO., 21, Cannon Street, Manchester, chemical and colour merchant. (O.M.A.D., 8/1/27.) Discharge suspended for 2 months until January 29.

New Companies Registered

ALEXANDER AND BRIDGE, LTD., 6, Brown Street, Manchester. Registered December 31. Nom. capital, £5,000 in £1 shares. To acquire the business of a dyestuff and chemical importer carried on at 6, Brown Street, Manchester, as "W. T. Alexander and Bridge," and to adopt an agreement with W. P. Bridge. Directors: W. P. Bridge, "Longfield," Lynton Park Road, Cheadle Hulme, Ches., J. A. Egerton, and H. R. Bridge.

AMALGAMATED PROCESSES, LTD., 3, Grosvenor Gardens, London, S.W.1. Registered December 28. Nom. capital, £2,000 in £1 shares (750 8 per cent. cumulative preference and 1,250 ordinary). To acquire the benefit of all or any options, agreements, licences or concessions relating to the manufacture of fireproof or weatherproof paint and all its products, and to carry on the business of manufacturers of glues, pigments, oils, adhesives, chemical compounds, cellulose products, etc. Directors: H. A. Wilson, 43, Rowan Road, Hammersmith, London, W.6, and L. Kecskemeti.

BARNFIELD COLOUR CO., LTD., Barnfield Works, West Ferry Road, Millwall, London, E.14. Registered December 31. Nom. capital, £100 in 1s. shares. To carry on the business of manufacturers and merchants (whether wholesale or retail) of colour, varnish, white lead and zinc and all kinds of coloured paints in pastes or otherwise, refiners of colza and other oils, etc.

ELECTRO-CHEMICAL PAINT CO., LTD., 104, High Holborn, London, W.C.1.—Registered December 31. Nom. capital, £5,000 in £1 shares. To carry on business as indicated by the title. Directors are: H. G. Furlong, "Beechwood," Grove Park, London, S.E.12; H. C. Rose.

PATERSON SOAP CO., LTD. Registered January 4. Nom. capital, £1,000 in £1 shares. Soap manufacturers, manufacturers of and dealers in oils and oleaginous and saponaceous substances, pharmaceutical, manufacturing, and general chemists and druggists, etc. Subscribers: R. V. Howley, 97, Twickenham Road, Leytonstone, London, E.11, and W. H. Morgan.

VITREA DRAWN SHEET GLASS CO., LTD. Registered December 31. Nom. capital, £1,000 in £1 shares. To carry on the business of manufacturers of glassware of all kinds, manufacturers of and dealers in pharmaceutical, medicinal, chemical, industrial and other preparations and articles, etc. Directors: E. F. Tetzeli, 37A, Queensborough Terrace, Hyde Park, London, W., J. Meisl and L. Morecki.

S. WRIGHT AND CO., LTD., Crown Buildings, Brooksbys Walk, Homerton, London, E.5.—Registered January 1. Nom. capital, £1,500 in £1 shares. To carry on the business of manufacturers, exporters and importers of and dealers in glass bottles and glass products of all kinds, etc.

Improved Quality of Milk

THE City Analyst of Dundee has compiled a table showing the average quality of the milk supply at about 40 different localities. As deduced from over 1,500 analyses taken under the Sale of Food and Drugs Act, the grand average for the counties of Forfarshire, Perthshire and Fifeshire is:—Butter-fat, 3·58 per cent.; non-fatty solids, 8·80 per cent. For the city of Dundee the figure for fat is the same as the grand average, and shows an improvement of 0·1 per cent., compared with the previous year. The grand average also is slightly higher.

Benn Brothers' Other Journals

THE CABINET MAKER.—The Trade and THE CABINET MAKER Diary; Industrial Designs; What the Buyer Wants; Furniture in the January Sales; The Inside of a Mattress: Article XXVI.

THE ELECTRICIAN.—Physical and Optical Societies' 17th Annual Exhibition; Supervisory Control of Substations; "Regenerative Telegraph Repeaters," by H. H. Harrison.

THE FRUIT GROWER.—Covent Garden Market Removal: Text of Bill and Schedules; Fruit Canning and Preferential Sugar Duties.

GARDENING ILLUSTRATED.—"More Garden Planning," by C. K. Hughes; The Best Flowering Shrubs; Success with Delphiniums; Fruit under Glass.

THE GAS WORLD.—Coal and Coke Statistics for 1925; "Elementary Thoughts on Gas Distribution," by W. Hole; Public Lighting of Calcutta.

THE HARDWARE TRADE JOURNAL.—The Hardware Distributors' Deliveries; Cold Weather Hints for Commercial Motor Owners; Buying Hardware: Purchase and Sales Records; Men in the Honours List.

THE TIMBER TRADES JOURNAL.—Railway Rates; Personality in Business: Gain and Loss; Saw Doctors' Parliament.